

This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

Google[™] books

https://books.google.com



C. BISSELL JENKINS
President

J. G. BARKLEY
Second Vice-President

MATTHEW B. BARKLEY Vice-President C. S. PITCHER Sales Manager JOHN P. THOMAS Secy. and Treas. A. ST. AMAND Sales Mgr., Tampa

THE CAMERON & BARKLEY COMPANY

ESTABLISHED 1865

MACHINERY AND SUPPLIES

FOR SAW MILLS, PHOSPHATE MINES, FERTILIZER FACTORIES, OIL MILLS, RAILROADS, CONTRACTORS, MACHINISTS, PLUMBERS, ETC.

CATALOGUE D

OFFICES AND WAREHOUSES

160-162 MEETING ST. CHARLESTON, S. C.

107 S. FRANKLIN ST. TAMPA, FLA.

THE NEW YORK
PUBLIC LIBRARY
495309

ACTOR, LENOX AND
TR EN FOURT S.
1811

Copyright, 1911, by R. R. Donnelley & Sons Company, Chicago, Ill.

Patent applied for on the system of figure numbering used in this catalogue

Compiled, printed, and bound by R. R. Donnelley & Sons Company Plymouth Court, Chicago, Illinois

WE REPRESENT

THE FOLLOWING WELL-KNOWN FACTORIES:

| GENERAL ASBESTOS & RUBBER CoSteam Packings |
|---|
| Graton & Knight Mfg. Co Leather Belt |
| New York Belting & Packing Co Belting and Hose |
| ERIE CITY IRON WORKS |
| THE FOOS GAS ENGINE CO |
| FAIRBANKS, MORSE & Co Steam Pumps |
| MORRIS MACHINE WORKS |
| THE LUNKENHEIMER CoSteam Specialities |
| FAIRBANKS COMPANY |
| American Tool Works |
| SIMONDS MFG. Co |
| TAYLOR IRON & STEEL CoManganese Steel |
| |
| Webster Mfg. Co |
| WEBSTER MFG. Co |
| • |
| J. A. FAY & EGAN COWood Working Machinery |
| J. A. FAY & EGAN CO |
| J. A. FAY & EGAN CO Wood Working Machinery LANE MFG. CO Saw Mills F. E. Myers & Bro Hand Pumps |
| J. A. FAY & EGAN CO. Wood Working Machinery LANE MFG. CO. Saw Mills F. E. MYERS & BRO. Hand Pumps COE MFG. CO. Veneer Machinery |
| J. A. FAY & EGAN CO. Wood Working Machinery LANE MFG. CO. Saw Mills F. E. MYERS & BRO. Hand Pumps COE MFG. CO. Veneer Machinery Lidgerwood Mfg. Co. Hoisting Engines |
| J. A. FAY & EGAN CO. Wood Working Machinery LANE MFG. CO. Saw Mills F. E. MYERS & BRO. Hand Pumps COE MFG. CO. Veneer Machinery LIDGERWOOD MFG. CO. Hoisting Engines American Spiral Pipe Works Spiral Riveted Pipe |
| J. A. FAY & EGAN CO. Wood Working Machinery LANE MFG. CO. Saw Mills F. E. MYERS & BRO. Hand Pumps COE MFG. CO. Veneer Machinery LIDGERWOOD MFG. CO. Hoisting Engines AMERICAN SPIRAL PIPE WORKS. Spiral Riveted Pipe ASBESTOS PROTECTED METAL CO. Roofing |

INDEX

| | A | Page |
|------------|--|-------------|
| ACME S | teel Elevator Buckets | 365-367 |
| Adjustabl | le Beam Clamps | 314 36 |
| " Rol | t Planest Stocks and Dies, Armstrong.t Stocks and Dies, Hart's | 784 |
| " Bol | Stocks and Dies, Hart's | 784 |
| DI A | wang mang man | |
| DUS | hings, Bard | 805 |
| " Die | Stocks, Forbes Patent | 849 808 |
| 3161 | tal Edges | 838 |
| " Rai | ling Fittings | 258 |
| " Rea | mers. One-Lock | 714 |
| " Rea | mers. One-Lock | 727-729 |
| D 11 | renches, Westcott | 787 |
| " Ster | Bearings | 360 |
| " Wed | D Bearings lges, Cast Iron Glue Warmers | 271 |
| Advance (| Glue Warmers | 676 |
| Adae Han | urpenters' | 511 |
| Augus, Ca | pers' | 507 |
| | | |
| " Ship | road | 507 |
| AUDEDS' SI | IW Sets | 1040 |
| All Diake | GRIDGES | 142 |
|) " Cool | ke Hose kspressors, Ingersoll-Rand | |
| " Com | pressors Inversall-Rand | 043 |
| | l Hose | 45 |
| | | |
| " Hois | sts, Curtis | 454 |
| " Pum | ip Packing, Dixie | 10 |
| " Pum | ia, Fiston tas, Curtis ap Packing, Dixie ap Packing, Hecla up Unions, Malleable Iron tage rea, Radiator | |
| " Pum | ipe | 1001 |
| Valv | es, Radiator | 99 |
| | | |
| | | |
| Almond D | Wrenches Wrill Chucks It Angle Transmission Coupling Pumps Hand Cylinder | 181 767 |
| " Righ | t Angle Transmission Coupling | ngs 430 |
| 7.5 | z umpe, manu Cynniuci | <i> </i> |
| Altitude G | auges | 140 |
| Almon D | l | 514 |
| American | Brass Cylinder Relief Velvoo | 116 |
| " Bras | B Pop Safety Valves | 113 |
| " Bras | auges cady Wrenches Brass Cylinder Relief Valves s Pop Safety Valves s Snifting Valves s Mater Relief Valves k Shapers ge Testers raulic Relief Valves Body Pop Safety Valves Body Water Relief Valves Body Water Relief Valves | 115 |
| Bran | Water Relief Valves | 118 |
| " Gen | E Sompers | 907, 908 |
| " Hvd | raulic Relief Valves | 116 |
| Iron | Body Pop Safety Valves | 114 |
| _ lron | Body Water Relief Valves | 118 |
| Lath | nt Joint Link Leather Belting ars | 898-903 |
| " Pate | ut Joint Link Leatner Belting | 27 004 |
| " Radi | al Drills | 894-897 |
| " Redi | stors | 942 |
| " Sew | ators. Mills. | . 1068-1069 |
| Bawc | iust Conveyors | 1069 |
| Ammonia (| iust Conveyors I Riveted Pipe Cylinder Lubricators | 229 |
| " Pitti | Des | 279. 280 |
| COMPA | res | 142 |
| * V-1 | | 001 |

| | Page |
|--|----------------------|
| Anchor Shackles, Pin | . 565 |
| Anchors, Concrete | . 314 |
| " Screw, Star | . 629 |
| Andrew's Patent Drill Sockets | . 682 |
| Andrus Barrel Loading Devices Angle Check Valves, Brass, Jenkins Bros. Check Valves, Brass, Lunkenheimer | . 351 |
| Augie Check Valves, Drass, Jenkins Bros | . 68 . 71 . 66 |
| " Check Valves Bress Standard | . (1 |
| Check Valves, Brass, Standard. Check Valves, Iron Body, Jenkins Bros. Check Valves, Iron Body, Lunkenheime | . 81 |
| " Check Valves, Iron Body, Lunkenheime | r 83 |
| " Cutter, Armor Plate | . 884 |
| Cutter, Armor Plate | . 271 |
| Jaw Tongs | . 544 |
| " Joints, Cast Iron | . 271 |
| " Valves, Brass, Clean Seat | 72 |
| Valves, Brass, Jenkins Bros. Valves, Brass, Lunkenheimer. Valves, Brass, Needle Point. | . 67 |
| " Valves, Brass, Lunkenheimer | 89, 70 |
| " Values Brass, Needle Point | . ,05 |
| " Valves, Brass, Safety | . 112 . 65 |
| " Valves, Iron Body, Extra Heavy | . 84 . 84 |
| " Valves, Iron Body, Jankins Bros | . 80° |
| Valves, Iron Body, Jenkins Bros Valves, Iron Body, Lunkenheimer | 82. 86 |
| " Valves, Iron Body, Safety | . 112 |
| " Valves, Iron Body, Standard | . 78 |
| Angles, Extras on | . 592 |
| Valves, Iron Body, Safety Valves, Iron Body, Standard Angles, Extras on Angular and Ratchet Drilling Machines | . 520 |
| Angular and Ratonet Drilling Machines. Antimony. Anvils. Sawmakers' Arbors, Bit Brace. Blacksmiths' Center. Cutter, Face Milling. Drill. | . 514 |
| Anvils | . 546 |
| Sawmakers' | . 1047 |
| Arnors, Dit Brace | . 708 |
| " Center | . 108 |
| " Cutter Face Milling | . 705 735 |
| " Drill | 736 |
| | |
| " Reamer | 5. 736 |
| " Reamer, One-Lock | . 727 |
| Reamer. 73: Reamer, One-Lock. Shell End Mill. | . 734 |
| " Swing Saw | . 1077 |
| Taper | . 768 |
| Area of Required Pipe, Rule for Finding | . 1139 |
| Armor Plate Angle Cutter | . 884 |
| Arms Telephone Equipoise | . 550 1194 |
| Armstrong Adjustable Rolt Stocks and Dies | 784 |
| Arms, Telephone, Equipoise Armstrong Adjustable Bolt Stocks and Dies "Adjustable Die Stocks." "Pipe Cutting Machines | 805 |
| " Pipe Cutting Machines 80 | 6. 807 |
| " Pipe Machines | 807 |
| " Tool Holders | 4-829 |
| " Universal Ratchets | . 52 2 |
| Armstrong's Pipe Machines | . 806 |
| Armstrong's Pipe Machines Artesian Well Engines Asbestos Block Covering | . 963 |
| Aspestos Block Covering | . 18 |
| " Cement" Disc Blow-Off Valves | . 18 . 109 |
| " Joint Runners | . 109 518 |
| " Mill Board | . 010 |
| " Mill Board | 20. 21 |
| " Paper | . 18 |
| Paper. Protected Metal. | 604 |
| " Rope Packing | . 17 |
| " Wick Packing | . 17 |
| Ash Cans | . 211 |
| Ash Cans | 9, 220 |

| • | | age |
|--|--|------------|
| Atmospheric Reducing V Attachments, Feed, Wire "Gauge, Height "Gauge, Surface | alves | 126 |
| Attachments, Feed, Wire | Rope | 071 850 |
| " Gauge, Surface | . | 360 |
| " Ratchet | | 805 |
| "Ratchet. "Speed Indicator Attachments for Closed E "for Combination So "for Detachable Link "for Ley Bushed Ch "for Riveted Drive C "for Riveted Sawdus "for Roller Bushed C Augers, Earth. "Ship. Aurora Red Sheet Packin Austin Steam Separators Auto-Desitive Injectors, I "Pump Oilers Automatic Band Saw Shs "Center Punches | | 361 |
| " for Combination So | ind Pintle Chain a | 332 |
| " for Detachable Link | Chain 323-3 | 328 |
| " for Ley Bushed Ch | ain329, 3 | 330 |
| " for Riveted Drive (| Chain | 331 |
| " for Roller Bushed (| t Chain334, 3 | 335 |
| Augers, Earth | | 013 |
| Ship | | 572 |
| Aurora Red Sheet Packin |)g | 12 |
| Auto Cle Wrenches | ••••• | 787 |
| Auto-Positive Injectors. | Penberthy 176. 1 | 77 |
| " Pump Oilers | | 205 |
| Automatic Band Saw Sha | arpeners1055, 10 |)56 |
| " Circular Saw Sharp | | 902 154 |
| Automatic Band Saw Sha "Center Punches "Circular Saw Sharp "Cross Cut Saw Sha Injectors, Metropol Injectors, Penberth "Planer Knife Grind "Rod Oil Cups Automobile Wrenches Auxiliary Railing Fitting: Awis, Belt Awing Sheets, Iron, Cor Axe Handle Hookaroons "Handles Axes, Broad "Chopping "Firemen's | rpeners10 |)51 |
| " Injectors, Metropol | itan | 81 |
| " Injectors, Penberth | y176-1 | 178 |
| " Rod Oil Cups | ers | 190 |
| Automobile Wrenches | | 95 |
| Auxiliary Railing Fittings | s. | 257 |
| Awis, Belt | | 35 |
| Ave Handle Hockstoons | rugated c | SCI |
| " Handles | | šii |
| Axes, Broad | | 07 |
| " Chopping | | 06 06 |
| " Firemen's | | Ю |
| B. B. B. Chain B. Chain Floor Plates Floor Plates B. & S. All Steel Screw D Babbitt Metal Bachelder Engine Indicat Back Geared Working He Pressure Valves, Iro Pressure Valves, No Pressure and Exhaus Bag Trucks | • | 80 |
| B. B. Chain | | 80 |
| B and C Ceiling Plates | | 115 |
| B. & S. All Steel Screw D | Privers 8 | 70 |
| Babbitt Metal | | 15 |
| Bachelder Engine Indicat | ors | 45 |
| " Pressure Valves Ire | esds | 30 |
| " Pressure Valves, No | oiseless. Davis 1 | 29 |
| " Pressure and Exhaus | st Relief Valves, Cranel | 30 |
| Balanced Valves, Davis. "Valves, Mason Balancing Machines, Knii Baling Presses, Steam | 4 | 92 |
| " Valves Mason | | 27 |
| Balancing Machines, Knit | fe | 42 |
| Baling Presses, Steam | | 34 |
| Baling Presees, Steam Ball Check Valves, Brass, "Check Valves, Brass "Gauge Cocks Joint Pipe Hangers, "Loint Figible | Lunkenbeimer | 71 66 |
| " Gauge Cocks | | 03 |
| " Joint Pipe Hangers, | Hanna | 12 |
| " Joints, Flexible | | 37 |
| " and Socket Floor Ste | ands Dodge 4 | 04 97 |
| " and Socket Hangers | Dodge 414. 4 | 15 |
| " and Socket Pillow Bl | locks, Dodge 4 | 18 |
| and Socket Post Har | igers, Dodge 4 | 16 |
| " ner Mile Cubic Var | | 28 20 |
| Balls, Bronze | | 12 |
| " Fall Line | | 69 |
| " Value Rubbe- | 8 | 32 |
| Joints, Flexible Points and Socket Floor Sts and Socket Pillow Bl and Socket Post Har Ballast Forks per Mile, Cubic Yar Balls, Bronze Fall Line Steel, Tool Valve, Rubber Saw Clamps Saw Filing Machine Saw Filing and Sett Saw Mills Saw Sets Saw Sets Saw Sharpeners, Au Saw Stretchers Saw Swages Saws Saws | | 12 58 |
| " Saw Filing Machine | s | 61 |
| " Saw Filing and Setti | ing Apparatus 10 | 61 |
| Saw Mills | | 64 60 |
| " Saw Scarfing Machi | nes 10 | 58 |
| " Saw Sets | | 61 |
| Saw Sharpeners, Au | tomatic 1055, 10 | 56 |
| " Saw Stretchers | | 57 12 |
| " Saws | | 73 06 |

| Band | d Saws, Crescent Saws, Simonds | | | ٠. | · · · · |
|--|---|---------------|----------|------------|---------|
| •• | 1 Ongs | | | | • • · · |
| Band | | | | ٠. | |
| | Heading | | | ٠. | |
| ** | Pile | | • • • | ٠. | |
| Bann | ner Sight Feed Lubricato Clamps, Measuring Folders, Keystone | rs | | :: | |
| Bar (| Clamps, Measuring | | <i>.</i> | | |
| ** | Folders, Keystone | | | ٠. | |
| ** | Lead | · · · · | | ٠. | • • • • |
| ** | Tin | | · · · | • | |
| Barb | Nails | | | | |
| | ed Dowel Pins | . | | | |
| Bard | Adjustable Bushings | • · · · | . | . . | |
| Bark | Spuds | • • • • | | • • | 103 |
| Barn | es Pipe Cutters | | | | |
| Barre | ter Knives tes Pipe Cutters el Loading Devices, And | rus. | | | |
| | | | | ٠. | |
| Rerre | Trucksels, Steelett Ratchet Jacks | | | • • | |
| Barre | ett Ratchet Jacks | | | | |
| Barro | ows. Boiled | | | | |
| •• | Canal | | | | |
| ** | Charging | | | | 4 |
| ** | | | | • • | 4 |
| •• | Concrete | | | | |
| " | Contractor's | | | | |
| | Dirt | | | | |
| •• | FoundryGeneral Purpose | | | | • • • • |
| •• | Mining | | | | |
| •• | Mortar | | | | |
| •• | Ore | | | | |
| ** | Phosphate | | | | • • • • |
| Bars. | Car Starter | | • • | | |
| | | | | | |
| ••• | Claw | | | | |
| | Car Starter | | | | |
| | Crow | | | | |
| | Crow | cing | | | |
| | Crow | cing | | | |
| | Crow | cing ht of | | | . 58 |
| | Crow | cing ht of | | | . 58 |
| | Crow | cing ht of | | | . 58 |
| Base Bashl Batte | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. ties, Carbon Cylinder. Dry. | cing ht of | | | . 58 |
| Base Bashl Batte | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity. | eing ht of | | | . 58 |
| Base Bashl Batte | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. tries, Carbon Cylinder. Dry. Gravity. | | | | . 58 |
| Base Bashl Batte | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. tries, Carbon Cylinder. Dry. Gravity. | | | | . 58 |
| Base Bashl Batte | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. tries, Carbon Cylinder. Dry. Gravity. | | | | . 58 |
| Base Bashl Batte Batte Batte Beaco Beade | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. ries, Carbon Cylinder. Dry. Gravity Samson. rry Zines ed Ceiling. | · · · · · | | | . 58 |
| Base Bashl Batte Batte Batte Beaco Beade | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. ries, Carbon Cylinder. Dry. Gravity Samson. rry Zines ed Ceiling. | · · · · · | | | . 58 |
| Base Bashl Batte Batte Beade Beade Beads | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves, eries, Carbon Cylinder. Dry. Gravity Samson. ery Zines on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. Clamps Adjustable | C | | | . 58 |
| Base Bashl Batte Batte Beade Beade Beads | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves, eries, Carbon Cylinder. Dry. Gravity Samson. ery Zines on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. Clamps Adjustable | C | | | . 58 |
| Base Bashl Batte Beaco Beade Beadi Beads | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. Prices, Carbon Cylinder. Dry. Gravity Samson. Pry Zines on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. | C | | of | . 58 |
| Base Bashl Batte Beaco Beade Beadi Beads | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. Prices, Carbon Cylinder. Dry. Gravity Samson. Pry Zines on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. | C | | of | . 58 |
| Base Bashl Batte Beaco Beade Beadi Beads | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. Prices, Carbon Cylinder. Dry. Gravity Samson. Pry Zines on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. | C | | of | . 58 |
| Base Bashl Batte Beaco Beade Beadi Beads | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eties, Carbon Cylinder. Dry. Gravity Samson. ry Zincs. on Light Lanterns. ed Ceilling. ing Hammers, Pneumatic Tools. s and Slicks. o Clamps, Adjustable. Hooks. lo, "I", Steel, Standard. ing Hoxes, Bond. Ends, Miter-Gear, Convings, Post, Dodge. Step. Adjustable. | C | | of | . 58 |
| Base Bashl Batte Beaco Beade Beads Beams Beams Beams Beams | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zines on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. to Clamps, Adjustable. Hooks. s, "I", Steel, Standard, ng Boxes, Bond. Ends, Miter-Gear, Conv ngs, Post. Dodge. Step, Adjustable. Vertical Shaft, Dodge | Weig | | of | . 58 |
| Base Bashl Batte Beacca Bead Beading Bearing B | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zines. on Light Lanterns. ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. s, "1", Steel, Standard. ing Boxes, Bond. Ends, Miter-Gear, Convings, Post, Dodge. Step, Adjustable. Vertical Shaft. Dodge Tubing. | Weig | | of | . 58 |
| Base Bashl Batte Beacca Bead Beading Bearing B | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zines. on Light Lanterns. ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. s, "1", Steel, Standard. ing Boxes, Bond. Ends, Miter-Gear, Convings, Post, Dodge. Step, Adjustable. Vertical Shaft. Dodge Tubing. | Weig | | of | . 58 |
| Base Bashl Batte Beacca Bead Beading Bearing B | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zines. on Light Lanterns. ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. s, "1", Steel, Standard. ing Boxes, Bond. Ends, Miter-Gear, Convings, Post, Dodge. Step, Adjustable. Vertical Shaft. Dodge Tubing. | Weig | | of | .4 |
| Base Bashl Batte Beacca Bead Beading Bearing B | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zines. on Light Lanterns. ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. s, "1", Steel, Standard. ing Boxes, Bond. Ends, Miter-Gear, Convings, Post, Dodge. Step, Adjustable. Vertical Shaft. Dodge Tubing. | Weig | | of | .4 |
| Base Bashl Batte Beacca Bead Beading Bearing B | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zines. on Light Lanterns. ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. h Clamps, Adjustable. Hooks. s, "1", Steel, Standard. ing Boxes, Bond. Ends, Miter-Gear, Convings, Post, Dodge. Step, Adjustable. Vertical Shaft. Dodge Tubing. | Weig | | of | . 38 |
| Base Bashl Batte Beacc Beadd Beadd Beam Bearing Beell of Beell of Bell | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eties, Carbon Cylinder. Dry. Gravity Samson. ery Zines. on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. o Clamps, Adjustable. Hooks. s, "I", Steel, Standard, ing Hoxes, Bond. Ends, Miter-Gear, Convigs, Post, Dodge. Step, Adjustable. Vertical Shaft, Dodge. Tubing. improved Steam Hamme ws. Awis. Cement. Clamps. Contacts, Table of. | weig | ht | | . 58 |
| Base Bashle Beater Beach Beath Belt A | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zincs on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. o Clamps, Adjustable. Hooks. s, "I", Steel, Standard, ng Boxes, Bond Ends, Miter-Gear, Conv ngs, Post, Dodge. Step, Adjustable. Vertical Shaft, Dodge Tubing. Improved Steam Hamme ws. Awis. Cement. Clamps. Contacts, Table of Couplings. | weig | ht | | 58 |
| Base Bashle Beater Beach Beath Belt A | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zincs on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. o Clamps, Adjustable. Hooks. s, "I", Steel, Standard, ng Boxes, Bond Ends, Miter-Gear, Conv ngs, Post, Dodge. Step, Adjustable. Vertical Shaft, Dodge Tubing. Improved Steam Hamme ws. Awis. Cement. Clamps. Contacts, Table of Couplings. | weig | ht | | . 58 |
| Base Bashle Beater Beach Beath Belt A | Crow. Grate Lining. Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eries, Carbon Cylinder. Dry. Gravity Samson. ry Zincs on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. t Clamps, Adjustable. Hooks. s, "I", Steel, Standard, ng Boxes, Bond Ends, Miter-Gear, Conv ngs, Post, Dodge. Step, Adjustable. Vertical Shaft, Dodge Tubing. Improved Steam Hamme ws. Awis. Cement. Clamps. Contacts, Table of Couplings. | weig | ht | | . 58 |
| Base Bashl Batte Beater | Crow. Grate Lining Steel, Concrete Re-infor Steel, Flat Rolled, Weig Tamping. Plates, Dodge. lin Y Blow-Off Valves. eties, Carbon Cylinder. Dry. Gravity Samson. ery Zines. on Light Lanterns ed Ceiling. ing Hammers, Pneumatic Tools. s and Slicks. o Clamps, Adjustable. Hooks. s, "I", Steel, Standard, ing Hoxes, Bond. Ends, Miter-Gear, Convigs, Post, Dodge. Step, Adjustable. Vertical Shaft, Dodge. Tubing. improved Steam Hamme ws. Awis. Cement. Clamps. Contacts, Table of. | weig | ht | | |

| Page | |
|---|---|
| Relt Hoists Lidgerwood 459 | Blacksmiths' Swages |
| Belt Hoists, Lidgerwood 459 " Hooks 31-33 " Knives 35 | Blacksmiths' Swages. "Taper Taps "Tongs |
| " Knives 35 | " Tones |
| " Lacing, Metallic | 1 '' Tools |
| " Lacing, Steel, Bristol's 33 | |
| " Lacing Machines 38 | " Vises |
| " Lacing Outfits 37 | Blades, Reamer, One- |
| " Markers | " Saw, Hack |
| " Planes, Adjustable | Blake Belt Studs |
| " Punches 34 | Vises |
| Rivets and Burrs | |
| Splicing Outrits | Blanks, Moulding "Moulding Cutter |
| U Tiphtonom Dodge | Moulding Cutter |
| " Tools 34-27 | " Pick Eye Bliss Belt Clamps |
| Punches | Block Covering Ashoe |
| " Leather 25–27 | Block Covering, Asbes "Covering, Magne |
| " Rubber | " Tin |
| " Woven, Cotton | Blocks, Foot, Derrick |
| Belting Information1137 | Covering, Magne "Tin Blocks, Foot, Derrick "Gin, Wrought Ir |
| Bemis and Call Wrenches 786 | " Head, Saw Mill |
| Bench Clamps 820 | " Pillow, Bond |
| Dusters | Pillow, Dodge |
| " Levels 863 | Set, Channeling. |
| " Mashines Timeses" | Skidder |
| " Shore 975 | Snatch, Mallean |
| " Stones Combination Carborundum 869 | Pillow, Bond. Pillow, Bonder. Set, Channeling. Skidder. Snatch, Malleab Snatch, Wire Ro |
| " Woven, Cotton 30 Belting Information 1137 Bemis and Call Wrenches 786 Bench Clamps 820 " Dusters 580 Levels 863 " Lifters, Moulders' 576 " Machines, Tinners' 875 " Stones, Combination, Carborundum 669 " Water Tool Grinders 916 Benches, Stationary 833 Benders, Rail, Emerson's 528 " Rail, Hydraulic 529 | " Sware |
| Benches, Stationary | Swage Malleabl Tackle, Steel Tackle, Wire Ro Tackle, Wood Blocks and Trolleys, T |
| Benders, Rail, Emerson's 528 | " Tackle, Steel |
| " Rail, Hydraulic | " Tackle, Wire Ro |
| " Rail, Jim Crow 527 | " Tackle, Wood |
| " Rail, Roller 527 | Blocks and Trolleys, T |
| Bending Rolls | Blow-Off Crosses, Cast |
| Bends, Pipe | |
| Benders, Rail, Emerson's 528 " Rail, Hydraulic 529 " Rail, Im Crow 527 " Rail, Roller 527 Bending Rolls 888 Bends, Pipe 223 Bent Rifflers 662 Bevel Gears 374 " Protractors 840 " Top Transfer Chain 339 Bevels 841 | " Valves, Duro " Valves, Iron Boo |
| 14 Destructors 940 | Planers Hand Puffel |
| " Ton Transfer Chain 330 | Blowers, Hand, Buffal "Pressure, Positiv "Pressure, Steel, 1 |
| Revels 841 | " Prossure Steel |
| " Combination 840 | Blue Plaster Board |
| " Improved | Board, Mill. Asbestos. |
| Bevels | Board, Mill, Asbestos. "Plaster, Blue |
| Bibb Ends, Hose | Board Rules Boards, Level, Step |
| Bijaw Chain Pipe Tongs, Vulcan 789 | Boards, Level, Step. |
| Same | Boat Spikes Bobs, Plumb |
| Dinder Frames, Dodge | Bobs, Plumb |
| Rinders and Trimmers Lath 1109 | "Plumb, Mercury "Plumb, Steel Bodies, Column, Wate Boiler Bolts, Steel |
| Binders and Trimmers, Lath 1108 | Rodies Column Water |
| Bit Brace Arbors 768 | Boiler Rolts Steel |
| " Brace Taps | |
| " Stock Countersinks, Three Groove 730 | " Compounds |
| " Stock Drills 700 | Couplings |
| " Stock Drills in Sets 699 | l "Fibone |
| Stock Reamers | " Feed Pumps, Fa |
| Bits, Machine700, 701 | |
| Matcher | " Fittings, Malleal " Flanges, Steel |
| Saah 1037 | rianges, Steel |
| " Iron Rurre 844 | " Patch Bolts |
| " Oil 23 | " Picks |
| " Pine | " Stay Bolts |
| Blacksmiths' Arbors 768 | " Taps |
| " Calipers 854 | " Taps "Tees, Circulating |
| " Cones | ' Tube Cleaner Re |
| " Cutting Chisels | "Tube Cleaners, I "Tube Cleaners, I "Tube Ferrules, C |
| " Flatters | " Tube Cleaners, T |
| " Forges | " Tube Ferrules, C |
| Cones 545 " Cutting Chisels 542 " Flatters 542 " Forges 552 " Fullers 542 " Fullers 542 | Tubes |
| " Hammers | " Tubes |
| " Hand Hammers | MOISE |
| " Hook and Handle Rules 926 | Boilermakers' Forges. |
| " Mandrela K45 | " Hammers |
| Hammers 542 Hammers 509 Hand Hammers 510 Hardies 542 Hook and Handle Rules 836 Mandrels 545 Post Drills, Buffalo 550, 551 Punches 542 Set Hammers 542 | Ratchets Boilers, Erie City Heating, Ideal |
| " Punches | " Heating Ideal |
| " Set Hammers | Bolt Clippers |
| " Set Hammers | Bolt Clippers. "Cutting Machine "Diag Solid |
| " Steel Dules 926 | l " Dian Calid |

| | Page |
|---|------------|
| Blacksmiths' Swages. " Taper Taps. " Tongs. " Tools. " Twist Drills. " Viess | 542 |
| " Tones | 543 544 |
| " Tools | 542 |
| " Twist Drills | 690-692 |
| " Vises | 816 |
| Vises. Blades, Reamer, One-Lock. " Saw, Hack Blake Belt Studs. " Vises Blakeslee Jet Pumps Blanks, Moulding | 727 |
| Blake Belt Stude | 535 |
| " Vises | 813 |
| Blakeslee Jet Pumps Blanks, Moulding "Moulding Cutter "Pick Eye Bliss Belt Clamps Block Covering, Asbestos "Covering, Aspessos "Tin Blocks, Foot, Derrick "Gin, Wrought Iron "Head, Saw Mill "Pillow, Bond Pillow, Dodge "Set, Channeling "Skidder "Snatch, Walleable Iron Shell "Snatch, Wood "Swage "Tackle Malleable Iron Shell "Tackle Malleable Iron Shell "Tackle Malleable Iron Shell | 185 |
| Blanks, Moulding | 1035 |
| " Moulding Cutter | 1037 |
| Rick Eye | 502 |
| Block Covering, Asbestos | 18 |
| " Covering, Magnesia | 18 |
| " Tin | 514 |
| Blocks, Foot, Derrick | 467 |
| " Gin, Wrought Iron | 448 |
| " Pillow Bond | 499 498 |
| " Pillow, Dodge | 417 418 |
| " Set, Channeling | 1039 |
| "'Skidder | 449 |
| "Snatch, Malleable Iron Shell | 443 |
| Snatch, Wire Rope | .445,447 |
| " Swame | 545 |
| " Tackle Malleable Iron Shell | 444 |
| " Tackle, Steel | 445 |
| " Tackle, Wire Rope | .446, 447 |
| " Tackle, Wood | 442 |
| Blocks and Trolleys, Triplex | 45 |
| " Valvas Brass | 100 110 |
| " Valves Duro | 111 |
| " Valves, Iron Body | 109-111 |
| Blowers, Hand, Buffalo | 555 |
| " Pressure, Positive | 556 |
| " Pressure, Steel, Buffalo | 557 |
| Board Mill Ashastos | 602 |
| " Plaster. Blue | 602 |
| Board Rules | 568 |
| Boards, Level, Step | 526 |
| Boat Spikes | 637 |
| " Plumb Moreum | 809 |
| " Plumb Steel | 864 |
| Bodies, Column, Water | 154 |
| "Snatch, Wire Rope. "Snatch, Wood. "Swage. "Tackle, Malleable Iron Shell. "Tackle, Wire Rope. "Tackle, Wood. Blocks-and Trolleys, Triplex. Blow-Off Crosses, Cast Iron. "Valves, Brass. "Valves, Brass. "Valves, Iron Body. Blowers, Hand, Buffalo. "Pressure, Steel, Buffalo. "Pressure, Steel, Buffalo. Blue Plaster Board. Board, Mill, Asbestos. "Plaster, Blue. Boards, Level, Step. Boat Spikes. Boats Blueb. "Plumb, Mercury. "Plumb, Steel. Bodies, Column, Water. Boiler Bolts, Steel. "Clamps. "Clamps. | 622 |
| " Clamps | 821 |
| " Compounds | 23 |
| " Elhows | 253 |
| " Feed Pumps, Fairbanks-Morse . 952 | 958, 959 |
| Boiler Bolts, Steel. "Clamps. Compounds. Couplings. Elbows. Feed Pumps, Fairbanks-Morse. 952 Feed Pumps, Knowles. Fittings, Malleable Iron. Flanges, Steel. Patch Bolts. Picks. Rivets. Stay Bolts. | .950, 951 |
| " Fittings, Malleable Iron | 253 |
| " Flanges, Steel | 233 |
| " Picks | 502 |
| " Rivets | 643 |
| " Stay Bolts | 621 |
| " Taps | 763 |
| " Tees, Circulating | 253 |
| Taps Taps Tees, Circulating Tube Cleaner Rods Tube Cleaners, Dean Tube Cleaners, Turbinc Tube Ferrules, Copper Tubes | 40 |
| " Tube Cleaners, Dean" | 43 |
| " Tube Ferrules, Copper | 227 |
| " Tubes | 226 |
| " and Duplex Pump Combined, Fairba | ınks- |
| MorseBoilermakers' Forges | . 964, 965 |
| Bollermakers Forges | 552 |
| " Ratcheta | 518 590 |
| Bolternakers Forges "Hammers "Ratchets Boilers, Erie City "Heating, Ideal Bolt Clippers "Cutting Machines, Little Giant. "Dias Solid | .936-941 |
| " Heating, Ideal | 942 |
| | |
| Bolt Chippers | 874 |

| 1 | Page | l Pag |
|---|-------------|--|
| Bolt Ends Equalizers, Perkins Stocks and Dies, Adjustable, Armstrong Stocks and Dies, Adjustable, Hart's Tongs. | 617 | Brass Ceiling Plates |
| " Equalizers, Perkins | 1106 | " Check Valves, Angle, Jenkins Bros 6 |
| "Stocks and Dies, Adjustable, Armstrong | 784 784 | " Check Valves, Angle, Lunkenheimer 7 " Check Valves, Angle, Standard 6 |
| " Tongs | 543 | " Check Valves, Ball, Lunkenheimer 7 |
| Bolted Barrows. Bolters, Perkins. | 487 | " Check Valves, Ball, Standard 6 |
| Bolters, Perkins | 1107 | "Check Valves, Angle, Standard. 60 "Check Valves, Ball, Lunkenheimer. 7 "Check Valves, Ball, Standard. 60 "Check Valves, Horizontal, Jenkins Bros. 63 |
| " Gang" Power Feed, Perkins | 1109 | |
| Rolts Roiler Steel | 622 | Check Valves, Swing, Jenkins Bros 6 |
| Bolts, Boiler, Steel. Boiler Patch. Boiler Stay. | 622 | Check Valves, Horizontal, Standard 6. Check Valves, Swing, Jenkins Bros. 6. Check Valves, Swing, Lunkenheimer 7. Check Valves, Swing, P.&.C. 6. Check Valves, Swing, Standard 6. |
| " Boiler Stay | 621 | "Check Valves, Swing, P.&.C |
| " Cant Hook | | " Check Valves, Swing, Standard |
| Carriage, Common | 618 | " Check Valves, Vertical, Lunkenheimer 7 |
| Louping Milled | nzı | " Check Valves, Vertical, Standard 6 |
| " Drift | 624 | Condenser Tubes |
| " Elevator. " Expansion, Machine | 630 | Check Valves, Swing, Standard |
| " Expansion Star 690 | 830 | " Cross Valves, Safety |
| " Machine. " Peavey. " Planer Head. | 616 | "Cross Valves, Standard 6 |
| " Peavey | 560 | "Cylinder Relief Valves, American 11 |
| " Roof | 010 695 | " E-panion Joints 13" |
| " Service Box | 1019 | Fittings, Cast Iron Pattern 32 |
| " Stove | 619 | " Fittings, Finished319, 32 |
| " Stud Tire | 623 | " Fittings, Rough |
| " Track | 624 | " Floor Plates |
| Bond Bearing Boxes | 423 | " Foot Valves 9 |
| " Clamp Boxes | . 424 | " Ges Mater Cooks 10" |
| " Pillow Blocks | , 425 | Gate Valves, Hose 70 Gate Valves, Jenkins 7 |
| | | Gate Valves, Jenkins |
| " Safety Set Collars | 413 | ' Cata Values Pratt & Cady 7 |
| " Shafting Couplings | 411 . | " Gate Valves, Quick Opening 70 |
| Shafting Hangers | -421 | Gate Valves, Quick Opening 70 Gate Valves, Scott 7 Gate Valves, Standard 7 Gate Valves, Standard 7 Gate Valves, Standard 7 Gate Valves 7 Gate Valves |
| Boots Flavator Cast Iron | 361 | "Gate Valves, Standard |
| " Elevator, Steel | 361 | " Clobe Valves Jankins Bros 6 |
| Post Hangers Safety Set Collars | 829 | Globe Valves, Lunkenheimer |
| Boss Scrapers Boston Glass Tube Cutters | 475 | "Globe Valves, Needle Point |
| Bottom Dump Buckets | 471 | "Grease Cups |
| Box Ends, Conveyor | 357 | |
| Box Ends, Conveyor | 358 | " Jacket Drive Well Points. 101 " Lubricators, Detroit . 197, 19 " Lubricators, Lunkenheimer . 196, 19 |
| | 575 630 | " Lubricators, Detroit |
| " Vises Solid | 816 | Machine Screws |
| Nails. Vises, Solid Boxes, Bearing, Bond Clamp, Bond Conveyor, Spiral 353, | 423 | Navy Valves 7 |
| " Clamp, Bond | 424 | " Oil Cups |
| " Fecentrie | 360 360 | " Pine Wrenches Hayden 78 |
| " Eccentric | 151 | " Pop Safety Valves, American 11 |
| | | " Railing Fittings |
| " Service | 1019 | " Rods, High |
| " Teke-IIn 362 | 363 | " Snifting Valves American 11 |
| rost, bond. Service. Service, Adjustable. Take-Up. 362, Boxwood Rules Boyer Piston Air Drills. Pagumatic Hammers | 866 | Navy Valves |
| Boyer Piston Air Drills | 501 | "Swing Joints, Lunkenheimer 12. |
| " Pneumatic Hammers | 500 530 | " Syphons |
| Braces, Rail. " Screw and Timber, Combined " Trench | 517 | "Throttle Valves, Lunkenheimer. 7 "Throttle Valves, Standard. 7 "Tubes, Tinning. 31 |
| " Trench | 517 | " Tubes, Tinning 31 |
| Brackets, Derrick | 469 | "Tubing, Cutting |
| Brackets, Derrick. "Telephone, Adjustable, Burns, "Wall, Extension, Dodge | 428 | Tubing, Seamless |
| Brads | 639 | " Unions, Finished |
| Braided Sash Cord | 376 | Tubes, Finning 31 Tubing, Cutting 31 Tubing, Seamless 316, 31 Tubing Taps, Brazed 76 Unions, Finished 31 Unions, Rough 32 Valves, Clean Seat 7 Valves, Jenkins Bros. 67, 6 Valves Jankenbeimer 69-7 |
| Brake Chains, Car | 381 | Valves, Clean Seat |
| Branch Tees Branding Irons, Adjustable | 570 | " Valves, Jenkins Bros |
| Brass Angle Valves, Clean Seat. " Angle Valves, Jenkins Bros. " Angle Valves, Lunkenheimer. 6" " Angle Valves, Needle Point. , , | 72 | " Valves, Pratt & Cadv 6 |
| " Angle Valves, Jenkins Bros | 67 | "Valves, Pratt & Cady 6 "Valves, Regrinding, Lunkenheimer 69, 7 "Valves, Renewo, Lunkenheimer 67, 7 |
| " Angle Valves, Lunkenheimer | 9, 70° | Valves, Renewo, Lunkenheimer 7 |
| " Angle Valves, Needle Point | 112 | Valves, Renewo, Lunkenheimer. 7 Valves, Standard 65, 66, 7 Water Relief Valves 117, 11 Wire 114, 115 117, 11 Wire 114, 115 117, 117 117, 118 118, 118, 118, 118, 118, 118, 11 |
| " Angle Valves, Standard | 65 | " Wire |
| Angle Valves, Safety. Angle Valves, Standard. Blow- Off Valves. Butterfly Valves, Lunkenheimer. Butterfly Valves, Standard. | , 110 | Wire Cloth 59 Brazed Brass Tubing Taps 76 |
| "Butterfly Valves, Lunkenheimer | 75 75 | Brazed Brass Tubing Taps |
| Dutterny valves, Standard | 10 | " Steel Oilers 20 |

| | Page |
|---|-------------------------|
| Brazed Tubing | . 317 |
| tubing, Cutaing | . 317 .1031 |
| Clamps, Saw | . 1060 |
| " Forges | 1059 |
| " Forges. " Tables, Saw. | 1059 |
| Breast Drills. " and Chain Drills, Combination Brick Cars | . 871 872 |
| Brick Care | . 872 . 536 |
| " Siding Steel | 606 |
| Bricks, Fire Bridge Bolts Builders Hammers Clamps Gang Cars | . 946 |
| Bridge Bolts. | 625 |
| " Clamps | . 821 |
| | 536 |
| '' Jacks | . 438 |
| Jacks | 0, 721 |
| " Recording Thermometers | . 148 |
| Bristol Recording Pressure Gauges "Recording Thermometers Recording Vacuum Gauges Bristol's Steel Belt Lacing Broad Axe Handles "Axes Bronze "Balls | . 148 |
| Bristol's Steel Belt Lacing | . 33 |
| Broad Axe Handles | . 511 |
| Records | . 507 . 514 |
| " Balls | 1012 |
| 44 Districtions | OE 4 |
| Brooms, Mill "Warehouse Brownlee Steam Saw Mill Feeds Brown's Trolleys | . 580 |
| Brownles Steam Saw Vill Foods | 1072 |
| Brown's Trolleys 45 | 2.453 |
| Brushes, Dry, Moulders' | . 579 |
| "Roofing. Bucket Carriers, Pivoted. "Elevators, Continuous. Buckets, Bottom Dumn | . 603 |
| Bucket Carriers, Pivoted | . 370 . 351 |
| Buckets, Bottom Dump | . 471 |
| " Clam Shell | |
| " Elevator, Malleable M. S. Iron | . 368 |
| " Elevator, Perforated | . 367 5–367 |
| " Elevator Steel Extra Heavy | . 369 |
| Clam Shell Elevator, Malleable M. S. Iron Elevator, Perforated Elevator, Steel, Acme | . 364 |
| * #C | |
| " Orange Peel | . 472 . 473 . 471 |
| | . 471 |
| | EOA |
| Buffalo Belt Fasteners. Blacksmiths' Post Drills | . 32 |
| " Blacksmiths' Post Drills55 | 0, 551 |
| " Portable Forges K5 | 2-554 |
| Punches Punches and Shears, Combined. Snips. | 884 |
| Punches and Shears, Combined | . 884 |
| " Snips Steel Pressure Blowers | 875 |
| Buffa, Muslin | . 557 . 674 |
| Buffs, Muslin Building Material, Metal | 599 |
| Paper 81 Paper 81 | 602 |
| Bull Dog Vises | 1,812 376 |
| " Rope. " Wheels Bulldozer Power Pumps " Working Heads. Bumpers, Carriage, Saw Mill Bunchers, Shingle, Iron Frame Bundling Wire Bunks, Dry Kiln Burner Pliers Burners, Fuel Oil Burns Adjustable Telephone Brackets Burners, Machines, Tinners' | 467 |
| Buildozer Power Pumps | 982 |
| Working Heads | 981 |
| Bumpers, Carriage, Saw Mill | 1100 |
| Rundling Wire | 648 |
| Bunks, Dry Kiln | 1090 |
| Burner Pliers | 873 |
| Burners, Fuel Oil | 1124 |
| Burring Machines, Tinners' | 877 |
| " Reamers | 733 |
| " Reamers. Burrs, Iron, Black. Burt Exhaust Pipe Heads. " Ventilators | 644 |
| Burt Exhaust Pipe Heads | 175 152 |
| Darking Adirectly Dead | 805 |
| "Hose Butchers' Steels, Carborundum Butterfly Valves, Brass, Lunkenheimer "Valves, Brass, Standard "Valves, Iron Body, Lunkenheimer "Valves, Iron Body, Standard. | 54 |
| Butchers' Steels, Carborundum | 670 |
| Butterny Valves, Brass, Lunkenheimer | 75 75 |
| Valves, Drass, Standard | 87 |
| " Valves, Iron Body, Standard | 87 |

| Page 100 | |
|---|-----|
| Butting Saws | 3. |
| Cable Conveyors, Steel | 1 |
| CABLE, Drilling | į |
| " Hydraulic Wheel Presses 89 | ì |
| Caliper Gauges, Adjustable | ŀ |
| " Gauges, Micrometer 84 | 1 |
| " Rules, Slide, Steel | 3 |
| " Sets, Micrometer | L |
| Calipers, Blacksmiths' 85 " Double 85 | , |
| " Double | ١, |
| " Firm Joint | 53 |
| | Š |
| Keyhole | |
| " Slide, Pocket | 1 |
| " Thread | ć. |
| | |
| Calking Hammers, Pneumatic 50 " Irons 57 Cameroid Ready Roofing 60 | 7 |
| " Irons |) |
| Can Screws. 21 | |
| Canal Barrows | 3 |
| Cane Mills. Golden's | 3 |
| Cans, Ash | |
| " Oil. Dispensing, Factory 21 | 1 |
| " Waste, Oily 21 | į |
| " Hook Clasps 56 | X |
| " Hook Clips 56 | X |
| Can Screws 21 Canal Barrows 48 Candle Wicking 11 Cane Mills, Golden's 11 Cans, Ash 21 " Oil 210,21 " Waste, Oily 21 Cant Hook Bolts 56 " Hook Clips 56 " Hook Clips 56 " Hook Handles 56 " Hook Sockets 56 | ij |
| " Hooks559, 56 | H |
| " Wheels 67 | 14 |
| Hook Sockets 56 | 1 |
| Cape Chisels | |
| Capillary Oiling Pillow Blocks, Dodge 41 | į |
| Capillary Oiling Pillow Blocks, Dodge. 41 Caps, Detonating. 57 Guy. 47 | 7 |
| " Hose | ١, |
| " Hose | i E |
| " Well, Sanitary101 | ì |
| Car Box Jack Screws | (|
| " Door Rollers | |
| Mast, Derrick 46 | 2 |
| " Replacers | |
| Pushers 52 52 Replacers 524, 52 Starter Bars 525, 52 Starter Bars 52 Starter Bars 52 Starter Bars 52 Starter Bars 52 Wheels, Chilled 54 Caraflora Covering 20, 2 Carbon Cylinder Batteries 112 Rubber Belting 2 Carborundum Bench Stones, Combination 66 Butchers' Steels 67 Knife Sharpeners 67 Pocket Stones 67 Carriage Bumpers, Saw Mill 107 "Clamps 82 Carriagemakers' Wrenches 79 Carriages, Londing 44 Carriages 104 Carriages 106 Carriages 106 Carriages 106 Carriages 106 Carriages 107 Carriages | 4 |
| Caraflora Covering | ì |
| Carbon Cylinder Batteries | 2 |
| Carborundum Bench Stones, Combination 66 | Ę |
| " Butchers' Steels | (|
| " Pocket Stones | č |
| Carriage Bumpers, Saw Mill | 1 |
| Carriagemakers' Wrenches | ė |
| Carriages, Loading | ç |
| Carriagemakers' Wrenches 79 Carriages, Loading 44 " Saw Mill 106 Carrier Frames, Dodge 42 Carriers, Bucket, Pivoted 37 " Open Top 37 Troughing, Robins' 34 Cars, Brick 53 " Dump 479, 48 | ę |
| Carriers, Bucket, Pivoted | C |
| " Troughing, Robins' 34 | ğ |
| Cars, Brick | 0 |
| | ä |

| | | | age |
|---|--|--------------------------------------|--|
| Cars, | Motor, Gasoline | | 537 |
| :: | Motor, Inspection | | 537 479 |
| •• | Phosphate, Self-Dumping | | 536 |
| ** | Track Laving | | 536 |
| Carts | Track Laying | | 489 |
| •• | Dump | | 490 |
| | Hose | · • · · | 487 |
| Com | Hose | | 59 633 |
| Cases | Drill | · · · · | 698 |
| Casin | , Drill g, Lap Welded g Nails fron Blow-Off Crosses | | 225 |
| Casin | g Nails | | 639 |
| Cast | Iron Blow-Off Crosses | | 268 |
| | Iron Ceiling Plates. | | 315 |
| ** | Iron Common Flanges | | 272 |
| •• | Iron Eccentric Fittings | | 268 |
| •• | Iron Elevator Boots | | 361 |
| •• | Iron Fittings, Extra Heavy . 275, 295- | 302, | 305 |
| •• | Iron Fittings, Flanged, Extra He | avy | |
| •• | Iron Cicular Flanges. Iron Common Flanges. Iron Eccentric Fittings. Iron Eccentric Fittings. Iron Ecventure State Heavy 275, 295- Iron Fittings, Extra Heavy 275, 295- Iron Fittings, Flanged, Extra Heavy 275, 295- Iron Fittings, Flanged, Standard. | -302, | 305 |
| | Iron Fittings, Flanged, Standard | . 282- | 293 |
| ** | Iron Fittings, Long Sween | 277 | 278 |
| •• | Iron Fittings, Flanged, Standard Iron Fittings, Hydraulic Iron Fittings, Long Sweep Iron Fittings, Screwed, Extra Heavy Iron Fittings, Screwed, Long Sweep Drundum Razor Hones | | 275 |
| | Iron Fittings, Screwed, Long Sweep. | 277. | 278 |
| Carbo | orundum Rasor Hones | . ' | 669 |
| | Iron Fittings, Screwed, Long Sweep, orundum Razor Hones. Slips Stones. Wheels s Tap Wrenches. s, File. Flexible Cement Roofing. ina Hot Water Spiral Packing. | 000 | 668 |
| ** | Wheele | . 668, | 069 |
| Card | a Tan Wrenches | .004- | 785 |
| Cards | . File | | 662 |
| Carey | Flexible Cement Roofing | | 600 |
| Carol | ina Hot Water Spiral Packing | | 5 |
| Carpo | enters' Adses | | 507 |
| Carr | Pump Governors | | 131 |
| Carri | Iron Fittings Samuel Standard | 960 | 960 |
| Cast | Iron Fittings, Sizes of | . 200- -260- | -263 |
| ** | Iron Fittings, Special. | | 271 |
| •• | Iron Fittings Standard 260-272 | | |
| | riou rictings, Standard 200-212, | 282- | -293 |
| •• | Iron Flange Unions | 282- | 293 270 |
| " | Iron Flange Unions | 282- | 293 270 235 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge. Iron Flanged Pulleys, Dodge. | 282- | 293 270 235 405 |
| •• •• •• | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flexible Joints Iron Floor Flanges | 282- | -293 270 235 405 139 272 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Planges Iron Floor Plates | 282- | -293 270 235 405 139 272 315 |
| | Iron Flange Unions Iron Flanged Pipe. Iron Flanged Pulleys, Dodge. Iron Flexible Joints Iron Floor Flanges Iron Floor Plates Iron Hook Plates | 282- | -293 270 235 405 139 272 315 309 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flexible Joints Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Pattern Brass Fittings | 282- | -293 270 235 405 139 272 315 309 321 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Patern Brass Fittings Iron Pipe | | -293 270 235 405 139 272 315 309 321 235 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Hook Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Spide Pulleys Iron Podge | 236, | -293 270 235 405 139 272 315 309 321 235 237 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Iron Iron Iron Iron Iron Iron Iron | 282- | -293 270 235 405 139 272 315 309 321 235 237 -401 -405 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Split and Loose Pulleys, Dodge Iron Tight and Loose Pulleys, Dodge Iron Tight and Loose Pulleys, Dodge | . 236, . 399 , 402- | -293 270 235 405 139 272 315 309 321 237 -401 -405 405 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Hook Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Trolleys | . 282- | -293 270 235 405 139 272 315 309 321 235 -401 -405 405 452 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Planges Iron Hook Plates Iron Hook Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Tight and Loose Pulleys, Iron Washers Iron Washers | 236, 399, 402- | -293 270 235 405 139 272 315 309 321 235 405 405 452 638 |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Trolleys Iron Washers Steel Tiller Rope | . 236, . 399, . 402- | $\begin{array}{c} \textbf{-293} \\ \textbf{-270} \\ \textbf{235} \\ \textbf{405} \\ \textbf{139} \\ \textbf{272} \\ \textbf{315} \\ \textbf{309} \\ \textbf{235} \\ \textbf{237} \\ \textbf{-405} \\ \textbf{405} \\ \textbf{405} \\ \textbf{452} \\ \textbf{634} \\ \textbf{348} \\ \textbf{848} \\ $ |
| | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flates Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tophat and Loose Pulleys, Dodg Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Irons, Dodge Iron Steel Piller Rope Iron Steel Piller Rope Iron Steel Rope Iron Ro | . 236, . 399, 402-ee | $\begin{array}{c} \textbf{-293} \\ \textbf{-270} \\ \textbf{235} \\ \textbf{405} \\ \textbf{139} \\ \textbf{272} \\ \textbf{315} \\ \textbf{309} \\ \textbf{235} \\ \textbf{-405} \\ \textbf{405} \\ \textbf{405} \\ \textbf{468} \\ \textbf{6388} \\ \textbf{-469} \\ \textbf{-469} \\ \end{array}$ |
| Casti | Flexible Cement Roofing in a Hot Water Spiral Packing intere' Adses Pump Governors age Bolts, Common iron Fittings, Sierewed, Standard Iron Fittings, Special Iron Fittings, Special Iron Fittings, Special Iron Fittings, Special Iron Fittings, Standard 260-272, Iron Flanged Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pileys, Dodge Iron Flexible Joints Iron Floor Plates Iron Floor Plates Iron Floor Plates Iron Pope Iron Pipe Iron Flook Plates Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Spilt Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Tight and Loose Pulleys, Dodg Iron Tolleys Iron Washers Steel Tiller Rope Steel Wire Irons, Derrick Smooth-On | . 236, . 399, . 402- | -293 270 235 405 139 272 315 309 321 235 -401 405 405 405 438 8648 -469 22 |
| Casti | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flexible Joints Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Ings, Derrick Smooth-On I Basin Covers | . 236, . 399, . 402- | 512 |
| Casti Catch | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Solid Pulleys, Dodge Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Trolleys Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Ings, Derrick Smooth-On In Basin Covers Ig, Beaded | . 236, . 399, . 402-se | $\frac{512}{606}$ |
| Casti Ceilir | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe Iron Pipe Iron Spit Pulleys, Dodge Iron Spit Pulleys, Dodge Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Ings, Derrick Smooth-On Basin Covers Ig, Beaded Stamped Iron Plates Iron Basin Covers Ig, Beaded Stamped Iron Plates Iron Basin Covers Ig, Beaded Stamped Iron Plates Iron Plates Iron Basin Covers Ig, Beaded Stamped Iron Plates Iron | 236, 399, 402-e | $\frac{512}{606}$ |
| Casti Catch | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Iron Specials Iron Washers Steel Wire Iron Specials Iron Washers Iron W | 236, 399, 402-e. | 512 606 606 315 |
| Casti Catch Ceilir Ceilir | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Hook Plates Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Split Pulleys, Dodge Iron Trolleys Iron Trolleys Steel Tiller Rope Steel Wire Iron Washers Steel Wire Iron Washers | 236, 236, 399, 402-e. | 512 606 606 315 315 |
| Casti. Catch Ceilir Cellar Ceme | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tipht and Loose Pulleys, Dodg Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Ings, Derrick Smooth-On Ings, Beaded Stamped Ing Plates, Brass Plates, Cast Iron Iron Box Cotters Iron Rose Iron Plates Iron Iron Plates Iron Iron Plates Iron Iron Iron Iron Iron Iron Iron Iron | 236, 399, 402- e. | 512 606 606 315 315 645 18 |
| Casti Catch Ceilir Cellar Ceme | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Solid Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Tight and Loose Pulleys, Dodg Iron Trolleys Iron Washers Steel Tiller Rope Steel Tiller Rope Steel Wire ngs, Derrick Smooth-On I Basin Covers Ig, Beaded Ig Plates, Brass Plates, Cast Iron Fox Cotters It, Asbestos Belt | 236, 399, 402-e. | 512 606 606 315 315 645 18 |
| Casti Catcl Ceilir Cellar Ceme | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe Iron Pipe Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Trolleys Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Iron Washers Iron Washers Steel Wire Iron Washers Ir | 236, 399, 402- | 512 606 606 315 315 645 18 39 22 |
| Casti Catcl Ceilir Cellar Ceme | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Hook Plates Iron Hook Plates Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Split Pulleys, Dodge Iron Split Pulleys, Dodge Iron Tright and Loose Pulleys, Dodg Iron Trolleys Iron Washers Steel Tiller Rope Steel Wire Ings, Derrick Smooth-On In Basin Covers Ing, Beaded Stamped Ing Plates, Brass Plates, Cast Iron Iron Fook Cotters Int, Asbestos Belt Iron Smooth-On Iron, Costerial Nails | 236, 399, 402-e. | 512 606 606 315 315 645 18 39 22 22 |
| Casti Catcl Ceilir Cellar Ceme | Iron Flange Unions Iron Flanged Pipe Iron Flanged Pipe Iron Flanged Pulleys, Dodge Iron Flanged Pulleys, Dodge Iron Floor Flanges Iron Floor Flanges Iron Floor Flanges Iron Floor Plates Iron Pattern Brass Fittings Iron Pipe Iron Pipe, Specials for Iron Solid Pulleys, Dodge Iron Solid Pulleys, Dodge Iron Tight and Loose Pulleys, Dodg Iron Tight and Loose Pulleys, Dodg Iron Tight and Loose Pulleys, Dodg Iron Tight Rope Steel Tiller Rope Steel Tiller Rope Steel Wire Ings, Derrick Smooth-On I Basin Covers Ig, Beaded Stamped Ig Plates, Brass Plates, Cast Iron Floor Cotters Int, Asbestos Belt Iron, Smooth-On Iron, Smooth | .236, .236, .399 .402- e | 512 606 606 315 315 645 18 39 22 640 |
| Catch Ceilir Ceilir Cellar Ceme | n Basin Covers. gg. Beaded. Stamped. g Plates, Brass. Plates, Cast Iron r Box Cotters nt, Asbestos Belt. Elastic, Smooth-On Iron, Simooth-On nt Coated Nails Roofing, Flexible, Carey | 282- 236, 399, 402- e | 512 606 606 315 315 645 18 39 22 22 |
| Catch Ceilir Ceilir Cellar Ceme "" Ceme Ceme | n Basin Covers. 1g, Beaded. Stamped. 1g Plates, Brass. 1g Plates, Cast Iron r Box Cotters nt, Asbestos Belt. Elastic, Smooth-On Iron, Smooth-On nt Coated Nails Roofing, Flexible, Carey r Arbors. Drills. | 236, 3399, 402-e. | 512 606 606 315 315 645 18 22 640 600 768 695 |
| Catch Ceilir Ceilir Cellar Ceme "" Ceme Ceme | a Basin Covers. ag. Beaded. Stamped. g Plates, Brass. Plates, Cast Iron r Box Cotters nt, Asbestos Belt. Elastic, Smooth-On Iron, Smooth-On nt Coated Nails Roofing, Flexible, Carey er Arbors. Drills. Gauges | 236, 236, 399, 402- e. | 512 606 606 315 315 645 18 22 640 600 768 695 857 |
| Catch Ceilir Ceilir Cellar Ceme "" Ceme Ceme | a Basin Covers gg, Beaded Stamped g Plates, Brass g Plates, Cast Iron r Box Cotters nt, Asbestos Belt Elastic, Smooth-On Iron, Smooth-On nt Coated Nails Roofing, Flexible, Carey re Arbors Drills Gauges Keys | 236, 339, 402-e. | 512 606 606 315 315 645 18 22 640 600 768 857 680 |
| Catch Ceilir Ceilir Cellar Ceme | a Basin Covers. ag. Beaded. Stamped. g Plates, Brass. Plates, Cast Iron r Box Cotters nt, Asbestos Belt. Elastic, Smooth-On Iron, Smooth-On nt Coated Nails Roofing, Flexible, Carey er Arbors. Drills. Glauges Keys. Punches | 236, 399, 402 | 512 606 606 315 315 645 22 640 768 689 869 |
| Catch Ceilir Ceilir Cellar Ceme Ceme | a Basin Covers gg, Beaded Stamped g Plates, Brass g Plates, Cast Iron r Box Cotters nt, Asbestos Belt Elastic, Smooth-On Iron, Smooth-On nt Coated Nails Roofing, Flexible, Carey re Arbors Drills Gauges Keys | 236, 339, 402-e. | 512 606 606 315 315 645 18 22 640 600 768 857 680 |

| Cente | er Testers |
|-------|--|
| Cent | er Testers ers, Lathe rifugal Oiling Devices Pump Ejectors Pump Flap Valves Pump Foot Valves Pumps 9 ury Gasket and Washer Cutters |
| Cent | Pump Ejectors |
| ** | Pump Flap Valves |
| •• | Pumps Q |
| Cent | ury Gasket and Washer Cutters |
| Chac | e's Oilers |
| Ciiai | e s Oilers n |
| ** | B.B.B. |
| •• | Conveyor |
| ** | Conveyor, Detachable |
| •• | Drag. Steel |
| ** | Dredge |
| | Orit-Proof Tiese |
| •• | Jacker, Log |
| •• | Ley Bushed |
| •• | Pintle, Closed End. |
| ** | Proof Coil |
| | Roller Bushed Malleshie |
| ** | Sawdust, Riveted33 |
| " | Sprocket Wheel |
| | Transfer. Bevel Top. |
| ** | Transfer, Detachable |
| | Twist Coil |
| Chai | n Conveyors, Link, Steel |
| " | Drills Elevators Gear, Silent |
| | Geer Silent |
| ** | Hoists, Differential, Duplex |
| ** | Hoists, Screw-Geared, Duplex |
| •• | Elevators. Gear, Silent Hoists, Differential, Duplex. Hoists, Screw-Geared, Duplex. Hoists, Spur-Geared, Triplex Hooks. Oiling Pillow Blocks, Dodge. Pipe Tongs, Champion. Pipe Tongs, Trimo. Pipe Tongs, Vulcan Rafting Dogs. ns, Brake, Car. Log Rafting. |
| ** | Oiling Pillow Blocks, Dodge |
| ** | Pipe Tongs, Champion |
| •• | Pipe Tongs, Trimo |
| ~". | Rafting Dogs |
| Chai | ns, Brake, Car |
| ** | Rafting |
| ** | Rolling |
| ** | Wrecking |
| Chal | lenge Double Acting Force Pumps |
| Char | Log Rafting Rafting Rolling Switch, Railroad Wrecking lenge Double Acting Force Pumps Measuring Tapes nois Skins npion Chain Pipe Tongs Exhaust Pipe Heads Expanding Mandrels Revolving Screens Rod Oil Cups Saw Swage Shapers Screw Drivers Steel Rock Crushers nneling Set Blocks nnels, Extras on Standard, Weight of ging Barrows Letters Chickers Letters |
| Char | npion Chain Pipe Tongs |
| " | Exhaust Pipe Heads |
| ** | Revolving Screens |
| ** | Rod Oil Cups |
| | Saw Swage Shapers |
| ** | Steel Rock Crushers |
| Char | ineling Set Blocks |
| Char | Standard. Weight of |
| Char | ging Barrows. |
| Chat | Standard, Weight of ging Barrows. tanooga Edging Grinders. Wood Splitting Machines k Valves, Brass, Angle, Jenkins Bros. Valves, Brass, Angle, Standard. Valves, Brass, Ball, Lunkenheimer. Valves, Brass, Ball, Standard. Valves, Brass, Boll, Standard. Valves, Brass, Horizontal, Jenkins Bros Valves, Brass, Horizontal, Lunkenheim Valves, Brass, Horizontal, Standard. Valves, Brass, Swing, Jenkins Bros. Valves, Brass, Swing, Jenkins Bros. Valves, Brass, Swing, Lunkenheimer. |
| Chec | k Valves, Brass, Angle, Jenkins Bros |
| ** | Valves, Brass, Angle, Lunkenheimer |
| ** | Valves, Brass, Angle, Standard |
| ** | Valves, Brass, Ball, Standard |
| | Valves, Brass, Horizontal, Jenkins Bros |
| 41 | Valves, Brass, Horizontal, Lunkenheim Valves, Brass, Horizontal, Standard |
| ** | Valves, Brass, Swing, Jenkins Bros |
| •• | Valves, Brass, Swing, Lunkenheimer |

| Page | Pag |
|---|---|
| Check Valves, Brass, Swing, Standard 66 | Clamps, Measuring Bar 85 |
| "Valves, Brass, Vertical, Jenkins Bros 68 "Valves, Brass, Vertical, Lunkenheimer. 71 "Valves, Brass, Vertical, Standard 66 | " Mender, Hose 5 " Pipe, Steam, Emergency 27 |
| " Valves Brass Vertical Standard 66 | Pipe, Water |
| | " Rule 84 |
| " Valves, Iron Body, Angle, Jenkins Bros. 81 | " Steel |
| " Valves, Iron Body, Angle, Lunkenheimer 83 | " Wire Rone 38 |
| " Valves, Iron Body, Horizontal, Jenkins Bros | " Wire Rope 38 Classification of Iron 593, 59 " of Malleable Iron Fittings 244-24 |
| " Valves, Iron Body, Horizontal, Lunken- | of Malleable Iron Fittings244-24 |
| heimer | " of Steel |
| " Valves, Iron Body, Horizontal, Standard 79 " Valves, Iron Body, Swing, Extra Heavy 85 | " of Tool Steel |
| " Valves, Iron Body, Swing, Hydraulic 85 | Clasps. Cant Hook 56 |
| " Valves, Iron Body, Swing, Jenkins Bros. 81 " Valves, Iron Body, Swing, Lunkenheimer 83 | Claw Bars |
| " Valves, Iron Body, Swing, Lunkenheimer 65 " Valves, Iron Body, Swing, P & C 81 | Clay Picks 50 Clean Seat Brass Valves 7 |
| Valves, Iron Body, Swing, Lunkenheimer 83 Valves, Iron Body, Swing, P&C | Cleaner Rods, Tube, Boiler. 4 Cleaners, Flue. 40-4 |
| " Valves, Iron Body, Vertical, Jenkins | Cleaners, Flue40-4 |
| Bros 81 " Valves, Iron Body, Vertical, Standard. 79 | " Tube, Boiler, Dean |
| " Valves lank | Cleats, Slab Conveyor, Coleman Improved 108 |
| Chemical Fire Extinguishers | Climax Bolted Barrows 48 |
| Chesterton Glass Tube Cutters 157 | |
| Chests, Tool, Steel | Clinch Nails 63 Cling Surface Belt Filler 3 |
| Chilled Car Wheels | Clip Gate Valves, Lunkenheimer 9 |
| Chime Whistles | Tongs |
| Chime whites | Clippers, Bolt |
| Chisels, Cape | Clips, Cant Hook 56 |
| Consens, Cape 573 Cold 573 Cutting, Blacksmiths 542 Diamond Point 573 573 573 | " Sprinkler |
| " Cutting, Blacksmiths | Clocks, Engine Room |
| | " Marine 14 |
| " Round Nose | " Watchman's, Newman 15 |
| " Track, Railroad | Cloth, Emery |
| Track, Railfoad 210 100 | " Garnet |
| " Reamers, Rose | " Sand |
| Chucking Reamers, Rose 718 " Reamers, Rose 718 " Reamers, Three Groove 722-725 Chucks, Drill, Almond 767 " Drill, Jacob's Improved 767 " Drill, Little Giant 766 " Drill, Child Giant 767 | " Wire, Brass |
| " Drill Jacob's Improved | u nr. o .10 |
| " Drill, Little Giant | " Wire, Copper |
| " Drill, Skinner 767 | Clutch Counlings, Friction, Dodge 407, 40 |
| " Lathe | "Couplings, Friction, M. & W 40 |
| Drill, Skinner 767 Drill, Skinner 767 Drill, Union Czar 769 Lathe 769-777 Lathe, Skinner 774-776 | "Wire, Coal Screen |
| Lathe, Union | Coach Screws |
| Planer, Massey's | Coach Screws. 62 Coal Barrows. 488, 49 |
| " Planer, Skinner | " Hole Covers |
| Circular Flances Cast Iron 272 | " Screen Wire Cloth |
| Circular Flanges, Cast Iron 272 "Hand Saw Gummers 1053 | " Screen Wire Cloth 59 " Screens 54 |
| " Saw Mandrels | " Sieves |
| " Saw Guides | Cochrane Feed Water Heaters. 17 " Steam Separators. 16 |
| " Saw Mills | Cock Wrenches, Steam 10 Cocks, Air 100, 10 |
| ** Cam Canage 1043 | " Cylinder 10 |
| " Saws, Disston | " Cylinder. 10 " Gauge. 102, 10 |
| Saws, Disston 1025, 1026 Saws, Simonds 1022-1024, 1030 Circulating Boiler Tees 253 | Gauge, Ball 10 Gauge, Compression 10 |
| Circumference Gauges | " Gauge, Compression |
| "Rules 867 Cistern Suction Pumps 986 Clam Shell Buckets 473 Clamp Boxes, Bond 423, 424 | " Gauge, Mississippi |
| Clam Shell Buckets | " Clauge Pittshurgh 10 |
| Clamp Boxes, Bond423, 424 | " Iron 10 |
| | " Meter, Gas, Brass |
| Clamps, Band Saw. 1058 Beam, Adjustable. 314 Belt. 36 30 36 | " Steam Brass 10 |
| " Belt | Coes Wrenches |
| " Bench 820 " Boiler 821 | " Packing, Flax, Phosphate Brand |
| " Beneing Sow 1060 I | Packing, Gum Core, Gilt Edge |
| Bridge | " Packing Semibronze |
| | Coils, Pipe. 22 Coke Barrows 48 |
| | Coke Barrows |
| " Key-Seat | " Forks 50 Cold Chisels 57 |
| " Machinists' 822 | Cold Chiscis |

| Page | Page |
|---|--|
| Cold Drawn Steel in Hexagons 394 | Conveyor Drive, Right Angle 35 |
| " Finished Steel in Squares | " Drive Rigs |
| Metal Saws, Lea-Simplex | Drive Rigs. 108 Flight Supports. 35 |
| Punched, Chamfered and Trimmed Nuts 632 | " Hangera Spiral ' 35/ |
| " Shuts | " Miter-Gear Bearing Ends 35 |
| Collar Oiling Pillow Blocks, Dodge | Conveyors, Cable, Steel |
| " Screws 615 | Fan. Continuous |
| Collars, Set, Safety, Bond | " Refuse |
| Shafting, Safety, Dodge 412 | " Refuse |
| Columbus Scrapers | " Sawdust American 1069 |
| Column Bodies, Water | " Spiral, Steel. 35- Cookson Steam Traps 16 |
| " Water, Safety, Reliance 155 | Coopers' Adzes |
| " Water, Safety, Reliance | " Rivets 64- |
| " Chain Special 338 | Cope Cutters. 103 |
| Gauges 140 Pipe Vises 813 Pipe Vises, Reed's 810 | Coping, Ridge, Metal. 60 Copper Boiler Tube Ferrules. 22 |
| " Pine Vises Dood's 910 | Copper Boiler Tube Ferrules |
| " Pliers 873 | " Floats |
| " Pliers | Gaskets, Solid, Corrugated. 300 Hammers, Solid. 500 Hose 5 |
| " Saw Tables | " Hose |
| " Stones, Carborundum 669 | " Ingots. 51' " Plated Steel Oilers. 20' " Rivets and Burrs. 22' |
| " Water and Steam Gauges 154 | " Plated Steel Oilers 20 |
| " Woodworkers, Crain | " Soch Cord |
| rev's | Wire 64 |
| rey's | " Wire Cloth 59 |
| Punches and Shears | Coppers, Soldering 87 |
| Saw Guides and Rounders | Cord, Sash, Braided Cotton |
| Commercial Square Flax Packing 9 | " Sash, Copper |
| Common Carriage Bolts 618 "Flanges, Cast Iron 272 "Grate Bars 944 | Sash, Galvanized |
| " Grate Bars 944 | " Sash Tinned 38" |
| " Naila | " Sash, Iron. 38" " Sash, Tinned. 38" Cord Wood Saws. 111 |
| Companion Flanges, Extra Heavy 303 | Corks, Oil Cup |
| "Flanges, Reducing, Extra Heavy 304 | Corner Fittings |
| "Flanges, Reducing, Standard | " Slicks, Moulders' 57" " Valves 10 |
| Compound Pine Joint Graphite 29 | Correct Steam Flue Cleaners 42 |
| Flanges, Standard 291 Compound, Pipe Joint. Graphite 22 Compound Regulators, Waters 133 | Corrugated Ash Cans |
| Compounds, Boller | " Iron Awning Sheets 60 |
| " Smooth-On 22 | " Iron Roofing 60" Solid Copper Gaskets 30 |
| Compressed Air Forges | Solid Copper Gaskets |
| Compression Gauge Cocks. 103 "Shafting Couplings, Bond. 411 | " Steel Fasteners 64 Corundum 67 |
| "Shafting Couplings, Dodge 410 Compressors, Air, Ingersoll-Rand 943 Concave Handle S Wrenches. 792 "Rollers 567 | Corundum 67 Cotter Mills 75 |
| Compressors, Air, Ingersoll-Rand 943 | COLLEGE COLLEG |
| Concave Handle 8 Wrenches 792 | " Spring. 64 Cotton Gins, Lummus. 1131, 113 " Gins, Platt's. 113 |
| " Rollers | Cotton Gins, Lummus1131, 1131 |
| " Saws, Simonds 1029 Concrete Anchors 314 | " Mill Hose |
| " Barrows | " Presses Nance 113 |
| " Carts 489 | " Presses, Nance |
| " Mixers, Smith | " Seed Forks. 50 " Waste. 1 |
| Mixers, X-L-All | " Waste 19 |
| " Re-inforcing Steel Bars 599 " Spreaders 481 | " Woven Belting 38 Counter Dusters 586 |
| Condenser Tubes, Brass. 317 | " Platform Soulog 404 |
| Condenser Tubes, Brass 317 Condensing Apparatus, Fairbanks-Morse 962 | Scales 490 Counterbores 731, 73 |
| Cones, Blacksmiths | Counterbores |
| Connecting Links | Counters, Revolution 144 Countershaft Box Ends, Conveyor 35 |
| Connections, Siamese | Countershalt Box Ends, Conveyor 35 |
| Conqueror Saw Swages 1041 | " Fixtures, Dodge |
| Conqueror Saw Swages 1041 Constant Angle Twist Drills 706-709 Continuous Bucket Elevators 351 | " Bit Stock, Three Groove |
| Continuous Bucket Elevators 351 | Countersinks and Drills, Combined730, 73 |
| " Pan Conveyors 370 | Countersinks 73 Bit Stock, Three Groove 73 Countersinks and Drills, Combined 730, 73 Coupling Bolts, Milled 62 Coupling Bolts, Milled 62 |
| Contractors' Suction Pumps 989 | |
| " Locomotives, Porter 541 | " Clutch, Friction, Dodge 407 40 |
| "Barrows 489 "Locomotives, Porter 541 "Picks 502 | " Clutch, Friction, M. & W. 40 |
| " Powder 571 | Boiler |
| Conveyor Box Ends | "Cut-Off, Friction, Dodge407, 40 |
| Conveyor Box Ends 357 "Box Lining 353 "Boxes, Spiral 353, 356 "Chain 380 "Chain 225 | Uut-Uit, Friction, M. & W 40 |
| " Chain 380 | " Hose state wrought from 24: |
| | " Hydraulic, Wrought Iron 24 |
| " Cleats, Slab, Coleman Improved 1085 | " Pipe, Wrought Iron 24 |
| " Countershaft Box Ends 358 | Hose |
| " Couplings 355 | " Rod. Pump |

| | • | Page |
|---------|---|--|
| Coup | lings, Shafting, Bond | 411 |
| :: | Shafting, Compression, Bond | 411 |
| | Shafting Dodge | 410 |
| ** | lings, Shafting, Bond | 419 |
| ** | Siamese | 412 |
| ** | Transmission, Right Angle, Almond | 430 |
| Cove | Siamose Transmission, Right Angle, Almond Wrought Iron Hand Saw Gummers | . 242, 243 |
| Cove | ll Belt Fasteners | 32 |
| | ring. Ashestos Moulded | 20, 21 |
| ** | Block, Asbestos | 18 |
| ** | Block, Magnesia. | 18 |
| ** | Caraflora | 20 21 |
| ** | Heat Proof | 20, 21 20, 21 20, 21 20, 21 |
| •• | Hecla | 20, 21 |
| •• | Jack Frost | 20, 21 |
| | Magnesia | 20, 21 |
| ** | Neptune | 20, 21 |
| •• | raimetto | 20. 21 |
| " | Pine Sectional | 20, 21 |
| •• | Tribestos | 20, 21 20, 21 20, 21 |
| | Vesuvius | 20, 21 |
| Cove | rs. Catch Basin | 512 |
| 44 | Vibro. rs, Catch Basin. Coal Hole. | 512 |
| ** | Crucible | |
| ** | Manhole | 512 |
| | Pile Head | 474 |
| ** | Tank | 1019 |
| Crain | Combination Woodworkers | 1115 |
| Crane | Back Pressure and Exhaust Relief V | alves 130 |
| Crent | Tank. Combination Woodworkers. Back Pressure and Exhaust Relief V Trolleys, Patented. Indexes. | 453 |
| | | 143 194 |
| ** | Shapers, American | 907, 908 |
| Crayo | Shapers, American ns, Lumber Metal Workers' ent Band Saws Hydrants Saw Tables | 569 |
| C | Metal Workers' | 569 |
| Cresc | Hudrants | 1110 1020 |
| | Saw Tables | 1020 |
| ** | | 1039 |
| O-:- | Street Washers oed Galvanized Sheets | 1020 |
| | | 606 673 |
| Crosb | Cut Saw Handles, Disston Cut Saw Sharpeners, Automatic | 389 |
| Cross | Cut Saw Handles, Disston | 1038 |
| •• | Cut Saw Sharpeners, Automatic | 1054 |
| :: | Cut Saws, Disston | 1034 |
| | Head Oiling Devices | 1033 |
| ** | lest Levels | 864 |
| •• | Ties per Mile of Single Track | 638 |
| ** | Valves, Brass, Jenkins Bros | 67 |
| ** | Valves, Brass Safety | 69, 70 |
| ** | Valves, Brass, Standard | 65 |
| •• | Valves, Iron Body, Jenkins Bros. | 80 |
| •• | Valves, Iron Body, Lunkenheimer | 82, 86 |
| •• | Valves, Iron Body, Safety | 112 |
| Cross | Ties per Mile of Single Track. Valves, Brass, Jenkins Bros. Valves, Brass, Lunkenheimer Valves, Brass, Stafety. Valves, Brass, Standard Valves, Iron Body, Jenkins Bros. Valves, Iron Body, Lunkenheimer Valves, Iron Body, Safety Valves, Iron Body, Standard ess, Blow-Off, Cast Iron bars. | $ \begin{array}{ccc} & 78 \\ & 268 \end{array} $ |
| Crow | bars | 523 |
| Crow | n Giana Uni Cuna | 189 |
| Cruci | blesers, Rock, Steel, Champion Frease | 578 |
| Cum (| ers, mock, over, Champion Traces | 484 |
| Cupa | Grease, Brass | 186 |
| 1 | Grease, Steel | 186 |
| ** | Oil, Brass. Oil, Glass. Oil, Locomotive. Oil, Rod, Automatic. Oil, Rod, Champion. | 187, 188 |
| ** | Oil Lossmating | 189-191 |
| ** | Oil. Rod. Automatic | 188 |
| •• | Oil, Rod, Champion | 190 |
| •• | Wiper | 195 |
| Curti | Wiper. Air Hoists. Gang Edgers | 454 |
| <u></u> | Gang Edgers | 1075 |

| | | Pag |
|--------------|---|----------------|
| Cushman F | Cace Plate Jaws. Pipe Trade. Pers. Uplings, Friction, Dodge | 778 |
| Customs, P | ipe Trade | 218 |
| " Nipp | ers | 86 |
| Cut-Off Co | uplings, Friction, Dodge4 | 07, 40 |
| Cutter An | dings, Friction, M. & W | 400 |
| Cutter Arb | ors, Face Milling | 73 |
| " Engir | nes | 73 |
| Cuttors Co | Cool Grinders, Dayton Universal. | 919 |
| " Gaini | ng | 1037 |
| " Gask | Cool Grinders, Dayton Universal ppe | 37 |
| " Gask | et, Rose | 869 |
| " Invol | ute | 54-756 |
| " Leath | ner, Lace | 3 |
| " Millir | ng | 40-747 |
| " Pipe. | | 103 <i>1</i> |
| " Pipe, | Barnes 80 80 80 80 80 80 80 80 80 80 80 80 80 | 800 |
| " Pipe, | Saunders | 800 |
| " Pipe, | Stanwood | 801 |
| " Pipe, | Stanwood. Trimo Vosper T | 800 |
| " Pipe, | Vosper | 800 |
| ** | ne Soner | 746 |
| " Sproc | T ng, Screw ket Wheel | 750 |
| " Stock | ing | 754 |
| " Tube | Glees | 44 |
| " Wash | er | 37 |
| " Wash | er, Rose | 869 |
| Cutters and | ket Wheel. ing. Glass er. er., Rose Pliers, Belt, Combination sather Belts ubber Belts ass Tubing. d Tubing. ls, Blacksmiths' inery, Veneer | 1113 |
| " for Le | eather Belts | . 35 |
| " for R | ubber Belts | 35 |
| Cutting Bra | ass Tubing | 316 |
| " Chise | ls. Blacksmiths' | 542 |
| " Mach | inery, Vencer110 | 1, 1102 |
| " Mach | ines, Bolt, Little Giant91 | 12, 913 |
| " Pipe t | o Order | 221 |
| " Pliers | | . 874 |
| Cutting-Off | Tools, Armstrong | . 826 |
| Cylinder Co | am Flue Cleaners | . 42 |
| " Oil | | . 23 |
| " Oil Pu | Impe, Hand | . 201 |
| Cylinders. F | vaives, Drass, American | . 115 1017- |
| " Rule f | or Finding, Capacity of | . 1139 |
| Cypress Tai | am Flue Cleaners locks limps, Hand Valves, Brass, American lump or Finding, Capacity of locks locks, Union D | J-1007 |
| Czar Driii C | D D | . 767 |
| D-S Ejector | s, Malleable Iron eadlights ced Valves Valves | . 185 |
| Dart Union | s, Malleable Iron | . 254 |
| Davis Balar | eadiights | . 215 . 127 |
| " Float | Valves | . 128 . 129 |
| 11 10100 | Dack Presente Valves | . 120 |
| " Reduc | nced Valves. Valves ess Back Pressure Valves. ire Regulating Valves. ing Valves. | . 119 |
| Dayton Uni | versal Cutter and Tool Grinders | . 919 |
| Deadening l | ing Valves. ing Valves. versal Cutter and Tool Grinders Felt. Tube Cleaners. jes. m Bands. | . 602 |
| Depth Gaus | Tube Cleaners | . 43 . 858 |
| Derrick Boo | m Bands | . 469 |
| " Brack | ets | 469 |
| " Castin | ugs | 17-469 |
| " Forgit | lgs | . 470 |
| Mast | om Bands ets | 468 |
| " Mast | Tops46 | 8, 469 |
| " Steps. | ************************************** | . 468 |
| " Winch | es46 | 1, 462 |
| Derncks, Gi | uy | . 466 |

| | Page |
|--|------------------|
| Desk Rules, Steel Desmond Diamo-Carbo Emery Wheel Dressers Link Chain Link Chain Link Chain Link Chain Link Chain Link Chain Transfer Chain Link Chain Letoctors Letoctors, Time, Watchman's, Newman Letonating Caps Letocit Locomotive Lubricators Low Water Alarms Sight Feed Lubricators Devices, Loading, Barrel, Andrus Oiling, Centrifugal Link Cross-Head | 837 |
| Desmond Diamo-Carbo Emery Wheel Dress- | |
| Detachable Conveyor Chain | 971 |
| " Link Chain 322 | -328 |
| " Link Chain, Attachments for 323 | -328 |
| " Link Chain Sprocket Wheels 340 | -343 |
| Transfer Chain | 328 |
| Detonating Cane | 571 |
| Detroit Locomotive Lubricators | 199 |
| " Low Water Alarms | 158 |
| " Sight Feed Lubricators | , 198 |
| Devices, Loading, Barrel, Andrus | 331 |
| " Oiling, Cross-Head | 194 |
| " Oiling, Crank Pin | 194 |
| "Oiling, Lunkenheimer | , 194 |
| " Oiling, Pillow Block | 194 |
| Devter Valve Reseating Machines | 190 876 |
| Diagonal Cutting Pliers | 874 |
| " Expansion Coil Packing | 7 |
| Dial Test Indicators, Universal | 859 |
| Diameter of Pump Cylinders, Rule for Find- | 1130 |
| Devices, Loading, Barrel, Andrus 'Oiling, Coss-Head Oiling, Cross-Head Oiling, Cross-Head Oiling, Cross-Head Oiling, Lonkenheimer Oiling, Pillow Block Oiling, Pillow Block Oiling, Nugents Dexter Valve Reseating Machines Diagonal Cutting Pliers Expansion Coil Packing Dial Test Indicators, Universal Diameter of Pump Cylinders, Rule for Finding Diamond Float Valves Point Chisels Turning Tools Diaphragm Reducing Valves Suction Pumps Signature of Pumps "Suction Pumps | 1010 |
| " Point Chisels | 573 |
| " Turning Tools | 671 |
| Diaphragm Reducing Valves | 126 |
| " Suction Pumps | $\frac{989}{63}$ |
| " Regulator Steam | 63 |
| Diappragm Reducing Valves "Suction Pumps Diappragms, Pump "Regulator, Steam "Rubber Die Dogs. "Sinkers | 63 |
| Die Dogs | 822 |
| " Sinkers | 662 |
| Stocks, Adjustable, Armstrong | 805 |
| " Stocks, Adjustable, Forbes Patent | . 808 |
| Dies Rolt Solid | 780 |
| " Machine | 780 |
| " Pipe, Solid | 804 |
| Dies and Stocks, Pipe801-803 | 5, 808 |
| Uletz Lamps | 214 |
| Differential Chain Hoists | 450 |
| Dimensions of Extra Heavy Flanged Fittings. | 305 |
| " of Standard Cast Iron Fittings | . 293 |
| Direct Acting Steam Feeds | 1074 |
| Dista Jankina | 488 |
| Dispensing Oil Cans Factory | 211 |
| Disston Circular Saws | 1026 |
| " Cross-Cut Saw Handles | 1038 |
| " Cross-Cut Saws | 1034 |
| Die Dogs. "Sinkers" "Stocks, Adjustable, Armstrong "Stocks, Adjustable, Forbes Patent "Stocks, Adjustable, Forbes Patent "Stocks, Adjustable, Toledo SO Dies, Bolt, Solid "Machine" "Pipe, Solid Dies and Stocks, Pipe SOII Lanterns "Lanterns Differential Chain Hoists Dimensions of Extra Heavy Flanged Fittings "of Standard Cast Iron Fittings Dirte Acting Steam Feeds Dirt Barrows Disce, Jenkins Dispensing Oil Cans, Factory Dissoton Circular Saws 1025, "Cross-Cut Saw Handles "Cross-Cut Saws "Saw Files | 1038 1041 |
| " Saw Swages | 1041 |
| Saw Files. Saw Gummers Saw Swages. Dividers, Bronze. Extension. Fay Patent Lock-Joint | . 854 |
| " Extension | 854 |
| Fay Patent | 850 |
| " Lock-Joint | . 853 |
| " Spring | . 851 |
| " Universal | 853 |
| Dixie Air Pump Packing | . 10 |
| " High Pressure Ring Packing | . 1 |
| " Two-Saw Trimmers | . 4 1076 |
| Dixon's Belt Dressing | . 39 |
| Dodge-American Rope Driving System 43 | 3 435 |
| Dodge Iron Sheaves. | . 379 |
| Transmission Machinery 395, 399-405 | |
| Page 1 Pa | 0~429 \$99 |
| " Die | 822 |
| " Eye | 564 |
| " Jacker, Log. | 1083 |
| Eye Jacker, Log. Lathe, Drop Forged Mill, Saw, Knight's Ideal Rafting, Chain | 823 1049 |
| " Rafting Chain | . 564 |
| | |

| Dogs, Ring Dollies, Horse Shoe Door Rollers, Car Dornant Warehouse Scales. Double Acting Force Pumps " Acting Ratchets, Renshaw Calipers. " Diamond Rubber Belting Extra Strong Pipe Squares " Tube Injectors, Universal, Körting Dowel Pins, Barbed |
|---|
| Dormant Warehouse Scales |
| Double Acting Force Pumps |
| " Acting Ratchets, Renshaw |
| " Calipers |
| " Extra Strong Pine |
| Squares |
| " Tube Injectors, Universal, Körting |
| |
| Draftsmen's Protractors. Scales Straight Edges T Squares. Drag Chain. Steel Sawa Scrapers Dredge Chain Dredges, Hydraulic Dredging Sleeves Dressing, Belt Rope, Manila Drift Bolts |
| " Straight Edges |
| " T Squares |
| Drag Chain, Steel |
| " Saw Machines, Perkins Champion |
| Sampara |
| Dredge Chain |
| Dredges, Hydraulic |
| Dredging Sleeves |
| Dressers, Emery Wheel |
| Dressing, Belt |
| Drift Rolts |
| " Hose |
| Drifting Picks |
| Drill Arbors |
| " Cases |
| Chucks Almond |
| " Chucks, Jacob's Improved |
| " Chucks, Little Giant |
| " Chucks, Skinner |
| " Chucks, Union Czar |
| " Crindon Vankon |
| " Holders Armstrong |
| " Hose, Air |
| " Hose Couplings, Rock |
| " Press Vises |
| Presses |
| |
| Sockets |
| Bressing, Bett Rope, Manila Drift Bolts Hose Drifting Picks Drill Arbors Cases Chuck Arbors Chucks, Jarob's Improved Chucks, Jarob's Improved Chucks, Skinner Chucks, Union Czar Gauges Grinders, Yankee Holders, Armstrong Hose, Air Hose Couplings, Rock Presse Ses Rods Sockets, Use-Em-Up |
| Sockets. Sockets, Use-Em-Up Shanks and Sockets, List of |
| Sockets. Sockets, Use-Em-Up Shanks and Sockets, List of Sleeves, Steel |
| " Shanks and Sockets, List of" Sleeves, Steel " View Outel Action Armstrong |
| " Shanks and Sockets, List of" Sleeves, Steel " View Outel Action Armstrong |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center Girder Oil Post Blacksmith's Buffalo Radial, American Reamers and Taps, Combined, Hphrey's Shell Straight Way, Jobbers Straight Way, Machinists Straight Way, Machinists Straight Way, Straight Shank Straight Way, Wire Gauge Taps, Conserved Taps, Combined, Way, Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Wire Gauge Taps, Combined Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Ware Gauge Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Way, Way, Way, Way, Way, Way, |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center Girder Oil Post Blacksmith's Buffalo Radial, American Reamers and Taps, Combined, Hphrey's Shell Straight Way, Jobbers Straight Way, Machinists Straight Way, Machinists Straight Way, Straight Shank Straight Way, Wire Gauge Taps, Conserved Taps, Combined, Way, Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Wire Gauge Taps, Combined Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Ware Gauge Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Way, Way, Way, Way, Way, Way, |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center Girder Oil Post Blacksmith's Buffalo Radial, American Reamers and Taps, Combined, Hphrey's Shell Straight Way, Jobbers Straight Way, Machinists Straight Way, Machinists Straight Way, Straight Shank Straight Way, Wire Gauge Taps, Conserved Taps, Combined, Way, Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Wire Gauge Taps, Combined Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Ware Gauge Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Way, Way, Way, Way, Way, Way, |
| "Shanks and Sockets, List of "Sleeves, Steel "Vises, Quick Action, Armstrong Drilling Cable "Flanged Valves and Fittings, Prices for "Flanged Valves and Fittings, Templ for "Machines, Angular and Ratchet "Posts, Keystone "Tools, Well Drills, Air, Piston "Bit Stock "Breast "Chain "Center "Girder "Oil "Post, Blacksmiths Buffalo "Radial, American "Reamers and Taps, Combined, H phrey's "Shell "Straight Way, Jobbers "Straight Way, Jobbers "Straight Way, Straight Shank "Straight Way, Taper Shank "Straight Way, Way, Gauge "Tap, Sizes of "Track "Twist, Blacksmiths" "Twist, Constant And. |
| "Shanks and Sockets, List of "Sleeves, Steel "Vises, Quick Action, Armstrong Drilling Cable "Flanged Valves and Fittings, Prices for "Flanged Valves and Fittings, Templ for "Machines, Angular and Ratchet "Posts, Keystone "Tools, Well Drills, Air, Piston "Bit Stock "Breast "Chain "Center "Girder "Oil "Post, Blacksmiths Buffalo "Radial, American "Reamers and Taps, Combined, H phrey's "Shell "Straight Way, Jobbers "Straight Way, Jobbers "Straight Way, Straight Shank "Straight Way, Taper Shank "Straight Way, Way, Gauge "Tap, Sizes of "Track "Twist, Blacksmiths" "Twist, Constant And. |
| "Shanks and Sockets, List of Sleeves, Steel Vises, Quick Action, Armstrong Drilling Cable Flanged Valves and Fittings, Prices for Flanged Valves and Fittings, Templ for Machines, Angular and Ratchet Posts, Keystone Tools, Well Drills, Air, Piston Bit Stock Breast Chain Center Girder Oil Post Blacksmith's Buffalo Radial, American Reamers and Taps, Combined, Hphrey's Shell Straight Way, Jobbers Straight Way, Machinists Straight Way, Machinists Straight Way, Straight Shank Straight Way, Wire Gauge Taps, Conserved Taps, Combined, Way, Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Straight Straight Way, Wire Gauge Taps, Combined Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Ware Gauge Taps, Combined Straight Way, Wire Gauge Taps, Combined Straight Way, Way, Way, Way, Way, Way, Way, Way, |

| | Page |
|--|--|
| Drille Twiet Johhere' | 885 |
| " Twist, Letter Size | . 685 |
| " Twist, Oil | . 709 |
| " Twist, Square Shank | . 693 |
| " Twist, Straight Shank 684, 685, 68 | 8, |
| | 709 |
| Twist, Taper Shank 080, 087, 702, 70 | 14,700 |
| " Twist Wire Gauge | 684 |
| " · Unright 89 | 1-893 |
| Drills in Sets | . 699 |
| " and Countersinks, Combined | 30, 731 |
| Drip Valves | . 193 |
| Drive, Conveyor, Right Angle | . 359 |
| " Pine | 224 |
| " Pine Counlings, Wrought Iron | 243 |
| " Rigs, Conveyor | 1084 |
| " Rigs, Conveyor, Sawdust 1086 | 3, 1087 |
| " Rigs, Live Roll | 1080 |
| " Shoes | 1013 |
| Well Points, Brass Jacket | 1014 |
| Driving System, Rone Dodge-American 43 | 33-435 |
| Drop Forged Lathe Dogs | . 823 |
| " Head Hangers, Dodge | . 417 |
| " Head Tools, Armstrong | . 824 |
| Dry Batteries | 1122 |
| " Vila Bunka | 1000 |
| " Kilns Standard | 1089 |
| Dryers, Phosphate, Lombard | 1129 |
| Duck Packing | . 11 |
| Duff-Bethlehem Hydraulic Jacks | . 441 |
| Duff Ratchet Jacks43 | 39, 440 |
| Telescope Screw Jacks | 70 490 |
| " Carta | 490 |
| Dumping Wagons | 478 |
| Duplex Power Pumps, Fairbanks-Morse | . 963 |
| " Pumps, Fairbanks-Morse | 52-961 |
| " Pumps, Knowles95 | M). 95 I |
| Screw-Geared Chain Holsts | 450 |
| | 450 |
| Duro Blow-Off Valves | 450 34, 965 . 111 |
| Duro Blow-Off Valves | 450 34, 965 . 111 .20, 21 |
| Steam Pumps, Fairbanks-Morse | 450 34, 965 111 20, 21 580 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering . Dusters, Bench. " Counter. | 450 34, 965 111 20, 21 580 580 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering. Dusters, Bench. " Counter. " Shop. " Set Moulder. | 450 34,965 111 20,21 580 580 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Counter. " Shop. " Soft, Moulders'. | 450 34, 965 111 580 580 580 579 571 |
| Steam rumps, rairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Counter. " Shop. " Soft, Moulders'. Dynamite. Dynamos, Gasoline Engine. | 450 34, 965 111 20, 21 580 580 579 571 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering. Dusters, Bench. " Counter. " Shop. " Soft, Moulders'. Dynamite. Dynamos, Gasoline Engine. | 450 34, 965 111 .20, 21 580 580 579 571 1119 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Counter. " Shop. " Soft, Moulders'. Dynamite. Dynamos, Gasoline Engine. EAGLE Anvils. | 450 34, 965 111 .20, 21 580 580 579 571 1119 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering. Dusters, Bench. " Shop. " Soft, Moulders'. Dynamite. Dynamos, Gasoline Engine. EAGLE Anvils. Earth Augers. | 450 34, 965 111 .20, 21 580 580 579 571 1119 546 1013 |
| Drills, Twist, Jobbers'. "Twist, Letter Size. Twist, Oil. "Twist, Square Shank. "Twist, Square Shank. "Twist, Straight Shank. 684, 685, 68. 689, 703, 705, 70. "Twist, Taper Shank. 686, 687, 702, 70. "Twist, Three Groove | 450 34, 965 111 20, 21 580 580 580 579 571 1119 546 1013 360 268 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. "Covering. Dusters, Bench. "Counter. "Shop. "Soft, Moulders'. Dynamite. Dynamite. Dynamite. EAGLE Anvils Earth Augers. Eccentric Boxes. "Fittings, Cast Iron. Economy Belt Lacing Machines. | 450 14, 965 111 20, 21 580 580 580 579 571 1119 546 1013 360 268 38 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Shop. " Soft, Moulders' Dynamite Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers. Eccentric Boxes. " Fittings, Cast Iron. Economy Belt Lacing Machines. Edger Saws, Simonds. | 450 14, 965 111 20, 21 580 580 580 579 571 1119 546 1013 360 268 38 38 38 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. "Covering. Dusters, Bench. "Counter. "Shop. "Soft, Moulders'. Dynamite. Dynamite. Dynamos, Gasoline Engine. EAGLE Anvils. Earth Augers. Eccentric Boxes. "Fittings, Cast Iron. Economy Belt Lacing Machines. Edgers Gang, Curtis. | 450 14, 965 111 20, 21 580 580 580 571 1119 546 1013 360 268 1028 1028 |
| Steam Fumps, Fairbanks-Morse 90 Duro Blow-Off Valves " Covering Dusters, Bench " Counter " Shop " Soft, Moulders' Dynamite Dynamite Dynamite EAGLE Anvils Earth Augers Eccentric Boxes " Fittings, Cast Iron Economy Belt Lacing Machines Edger Saws, Simonds Edger Saws, Curtis Edges, Metal, Adjustable | 450 14, 965 111 20, 21 580 580 580 571 1119 546 1013 360 268 38 1028 1028 1028 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Shop. " Soft, Moulders' Dynamite Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers. Eecentric Boxes. Fittings, Cast Iron. Economy Belt Lacing Machines. Edger Saws, Simonds. Edgers, Gang, Curtis. Edges, Metal, Adjustable. " Straight, Combination. | |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. "Covering Dusters, Bench. "Counter. "Shop. "Soft, Moulders'. Dynamite. Dynamos, Gasoline Engine. EAGLE Anvils. Earth Augers. Eccentric Boxes. "Fittings, Cast Iron. Economy Belt Lacing Machines. Edger Saws, Simonds. Edgers, Gang, Curtis. Edgers, Gang, Curtis. Edges, Metal, Adjustable. "Straight, Combination. "Straight, Draftsmen's. "Straight, Draftsmen's. | |
| Steam Fumps, Fairbanks-Morse 90 Duro Blow-Off Valves " Covering Dusters, Bench " Counter " Shop " Soft, Moulders' Dynamite Dynamite Dynamite EAGLE Anvils Earth Augers Eccentric Boxes " Fittings, Cast Iron Economy Belt Lacing Machines Edgers, Gang, Curtis Edgers, Gang, Curtis Edges, Metal, Adjustable " Straight, Combination Straight, Draftsmen's " Straight, Sawmakers' " Straight, Sawmakers' | 450 14, 965 111 20, 21 580 580 579 571 1119 546 1013 360 268 1075 838 837 1047 838 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Shop. " Soft, Moulders'. Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers. Eecentric Boxes. " Fittings, Cast Iron. Economy Belt Lacing Machines. Edger Saws, Simonds. Edgers, Gang, Curtis. Edgers, Gang, Curtis. Edges, Metal, Adjustable. " Straight, Combination. " Straight, Draftmen's. " Straight, Draftmen's. " Straight, Sawmakers. " Straight, Steel. Edging Grinders, Chattanooga. | 450 44,965 111 20,21 580 580 580 579 571 1119 546 1013 360 268 38 1028 838 1075 838 838 1047 838 837 1047 |
| Steam Fumps, Fairbanks-Morse of Covering Dusters, Bench Counter Shop Soft, Moulders' Dynamite Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers Eccentric Boxes Fittings, Cast Iron Economy Belt Lacing Machines Edger Saws, Simonds Edgers, Gang, Curtis Edges, Metal, Adjustable Straight, Combination Straight, Draftsmen's Straight, Draftsmen's Straight, Steel Edging Grinders, Chattanooga Edging Grinders, Chattanooga Edging Grinders, Chattanooga | 450 14, 965 111 20, 21 580 580 579 571 1119 546 1013 360 268 38 1028 1075 838 838 1047 838 838 837 1047 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. "Covering Dusters, Bench. "Counter. "Shop. "Soft, Moulders'. Dynamite. Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers. Eccentric Boxes. "Fittings, Cast Iron. Economy Belt Lacing Machines. Edger Saws, Simonds. Edgers Gang, Curtis. Edges, Metal, Adjustable. "Straight, Combination. "Straight, Draftsmen's. "Straight, Sawmakers' "Straight, Sawmakers' "Straight, Steel. Edging Grinders, Chattanooga. Eddison Base Lamps, Standard. 1846 Rubber Belting. | 450 14, 965 111 20, 21 580 580 580 579 571 1119 546 1013 360 268 1028 1028 1075 838 1075 838 1075 838 1120 1120 128 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Shop. " Soft, Moulders'. Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers. Eccentric Boxes. " Fittings, Cast Iron. Economy Belt Lacing Machines. Edger Saws, Simonds. Edgers, Gang, Curtis. Edgers, Gang, Curtis. Edgers, Wetal, Adjustable. " Straight, Combination. " Straight, Combination. " Straight, Steel. Edging Grinders, Chattanooga. Edison Base Lamps, Standard. 1846 Rubber Belting. Elector Strainers. | 450 44,965 111 20,21 580 580 580 579 571 1119 546 1013 360 268 38 1075 838 838 1075 838 837 1047 838 838 837 1047 847 858 858 858 858 858 858 858 85 |
| Steam Fumps, Fairbanks-Morse. 90 Duro Blow-Off Valves. " Covering Dusters, Bench. " Shop. " Soft, Moulders' Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers. Eccentric Boxes. " Fittings, Cast Iron. Economy Belt Lacing Machines. Edger Saws, Simonds. Edgers, Gang, Curtis. Edgers, Gang, Curtis. Edges, Metal, Adjustable. " Straight, Combination. " Straight, Draftsmen's. " Straight, Steel. Edging Grinders, Chattanooga. Eddison Base Lamps, Standard. 1846 Rubber Belting. Ejector Strainers. Ejector Strainers. Ejectors, Centrifugal Pump. D-S | 450 44,965 111 20,21 580 580 580 579 571 1119 546 1013 360 268 388 1028 1078 838 1078 838 837 1047 838 1120 28 1185 |
| Steam Fumps, Fairbanks-Morse of Couro Blow-Off Valves "Covering Dusters, Bench "Counter" Shop Soft, Moulders' Dynamite Dynamos, Gasoline Engine EAGLE Anvils Earth Augers Eccentric Boxes Fittings, Cast Iron Economy Belt Lacing Machines Edger Saws, Simonds Edgers, Gang, Curtis Edges, Metal, Adjustable Straight, Combination Straight, Draftsmen's Straight, Draftsmen's Straight, Sawmakers' Straight, Sawmakers' Straight, Steel Edging Grinders, Chattanooga Edison Base Lamps, Standard 1846 Rubber Belting Ejector Strainers Ejectors, Centrifugal Pump D-S Penberthy | 450 44,965 111 20,21 580 580 580 579 571 1113 360 268 38 1025 838 1075 838 1075 838 1088 1120 28 1188 1 |
| Steam Fumps, Fairbanks-Morse "Covering Dusters, Bench "Counter "Shop "Soft, Moulders' Dynamite Dynamite Dynamite EAGLE Anvils Earth Augers Eccentric Boxes "Fittings, Cast Iron Economy Belt Lacing Machines Edgers, Gang, Curtis Edgers, Gang, Curtis Edges, Metal, Adjustable "Straight, Combination Straight, Draftsmen's "Straight, Sawmakers' "Straight, Sawmakers' "Straight, Steel Edging Grinders, Chattanooga Edison Base Lamps, Standard 1846 Rubber Belting Ejector Strainers Ejecto | 450 44,965 111 20,21 580 580 580 579 571 1119 546 1013 360 268 38 1028 838 1075 838 837 1047 838 1120 28 185 185 185 |
| Steam Fumps, Fairbanks-Morse of Couro Blow-Off Valves of Covering Dusters, Bench of Counter Shop Soft, Moulders' Dynamos, Gasoline Engine. EAGLE Anvils Earth Augers Eccentric Boxes of Fittings, Cast Iron Economy Belt Lacing Machines Edger Sawa, Simonds Edgers, Gang, Curtis Edgers, Cast Iron Estraight, Adjustable Straight, Grombination Straight, Draftsmen's Straight, Steel Edging Grinders, Chattanooga Eddison Base Lamps, Standard 1846 Rubber Beltung Ejector Strainers Ejectors, Centrifugal Pump D-S Penberthy Elastic Cement, Smooth-On Elbows, Boiler. | 450 4,965 111 20,21 580 580 579 571 1119 546 1013 360 268 1028 1075 838 1075 838 1047 1047 1047 1049 105 |
| Steam Fumps, Fairbanks-Morse "Covering Dusters, Bench "Counter "Shop "Soft, Moulders' Dynamite Dynamos, Gasoline Engine EAGLE Anvils Earth Augers Eccentric Boxes "Fittings, Cast Iron Economy Belt Lacing Machines Edger Saws, Simonds Edgers, Gang, Curtis Edges, Metal, Adjustable "Straight, Combination "Straight, Draftsmen's "Straight, Sawmakers' "Straight, Sawmakers' "Straight, Steel Edging Grinders, Chattanooga Edison Base Lamps, Standard 1846 Rubber Belting Ejector Strainers Ejectors, Centrifugal Pump "D-S Penberthy Elastic Cement, Smooth-On Elbows, Boiler. "Union, Malleable Iron | 450 44,965 111 20,21 580 580 580 580 587 571 1113 360 268 38 1028 1075 838 1028 1075 838 1028 1085 1120 281 1120 281 1120 282 283 184 222 253 |
| Steam Fumps, Fairbanks-Morse "Covering Dusters, Bench "Counter "Shop "Soft, Moulders' Dynamite Dynamos, Gasoline Engine EAGLE Anvils Earth Augers Eccentric Boxes "Fittings, Cast Iron Economy Belt Lacing Machines Edgers (ang, Curtis Edgers, Gang, Curtis Edges, Metal, Adjustable "Straight, Combination Straight, Draftsmen's "Straight, Sawmakers "Straight, Sawmakers "Straight, Steel Edging Grinders, Chattanooga Edison Base Lamps, Standard 1846 Rubber Belting Ejector Strainers Ejectors Centrifugal Pump D-S Penberthy Elastic Cement, Smooth-On Elbows, Boiler "Union, Malleable Iron Electric Engines, Foos. 95 | 450 4, 965 11, 915 111 20, 21 580 580 580 579 571 1119 546 1013 360 268 388 1028 1075 838 1088 1120 288 185 1185 1185 184 2253 253 26, 927 |
| Steam Fumps, Fairbanks-Morse 90 Duro Blow-Off Valves "Covering Dusters, Bench "Counter Shop Soft, Moulders' Dynamos, Gasoline Engine Earth Augers Eccentric Boxes Fittings, Cast Iron Economy Belt Lacing Machines Edger Saws, Simonds Edgers, Gang, Curtis Edgers, Gang, Curtis, Edges Metal, Adjustable Straight, Combination Straight, Draftsmen's Straight, Steel Edging Grinders, Chattanooga Edison Base Lamps, Standard 1846 Rubber Belting Ejector Strainers Ejectors, Centrifugal Pump D-S Penberthy Ensiet Cement, Smooth-On Elbows, Boiler Union, Malleable Iron Electric Engines, Foos 95 Headights Hista Ladgerwood | 450 44,965 111 20,21 580 580 580 579 571 1119 546 1013 360 268 38 1028 1075 838 1028 1047 838 1120 285 185 184 22 253 26,927 215 |
| Steam Fumps, Fairbanks-Morse "Covering Dusters, Bench "Counter "Shop "Soft, Moulders' Dynamite Dynamos, Gasoline Engine EAGLE Anvils Earth Augers Eccentric Boxes "Fittings, Cast Iron Economy Belt Lacing Machines Edger Saws, Simonds Edgers, Gang, Curtis Edges, Metal, Adjustable "Straight, Combination "Straight, Draftsmen's "Straight, Sawmakers' "Straight, Sawmakers' "Straight, Steel Edging Grinders, Chattanooga Edison Base Lamps, Standard 1846 Rubber Belting Ejector Strainers Ejectors, Centrifugal Pump "D-S "Penberthy Elastic Cement, Smooth-On Elbows, Boiler "Union, Malleable Iron Electric Engines, Foos. "Headlights "Hoists, Lidgerwood Screw Drivers Electriciams Levels "Levels | 450 44,965 111 20,21 580 580 580 580 579 571 1119 546 1013 360 268 1028 1075 838 1075 838 1120 28 1120 28 1120 28 185 27 215 460 870 |

| | | _ |
|---|--------------------|----------------|
| | Pa | ge |
| Elevator Bolts. "Boots, Cast Iron. "Boots, Steel. "Buckets, Malleable M. S. Iron. "Buckets, Perforated. "Buckets, Steel, Acme. "Buckets, Steel, Extra Heavy. "Buckets, Steel, Salem. Elevators, Bucket, Continuous. "Chain. | . 62 | 20 |
| " Boots, Cast Iron | . 30 | 81 |
| " Boots, Steel | . 30 | 81 |
| " Buckets, Malleable M. S. Iron | . 30 | 85 |
| Buckets, Periorated | . 30 | 67 |
| Buckets, Steel, Acme | シージ | 97 |
| " Buckets, Steel, Extra neavy | . 37 | 64 |
| Elevatora Bucket Continuous | . 3 | 51 |
| " Chain | 3. | 52 |
| Chain. Ellis Cast Iron Pipe Cutters. Emergency Steam Pipe Clamps. Emerson Foot Valves. "Steam Pumps" Strainers. | . 80 | 0ī |
| Emergency Steam Pipe Clamps | . 2 | 74 |
| Emerson Foot Valves | . 9 | 98 |
| " Steam Pumps | . 9 | 47 |
| " Strainers | { | 98 |
| Strainers. Emerson's Rail Benders. Emery. Paper. Cloth. | . 5 | 28 73 72 |
| Emery | . 0 | 13 |
| " Paper | . 0 | 12 79 |
| " Wheel Dressers | . 6 | 71 |
| " Wheel Grinders 916-918, 1069 | 10 | ŔŜ. |
| " Wheels | 6. 6 | 67 |
| Emmert Universal Vises | . 8 | 15 |
| End Cutting Nippers | . 8 | 74 |
| " Mills78 | 0-7 | 52 |
| End Cutting Nippers. 78 "Mills 78 Endless Rubber Belting. Ends, Bearing, Miter-Gear, Conveyor. | ٠. : | 28 |
| Ends, Bearing, Miter-Gear, Conveyor. "Bot "Bibb, Hose. "Box, Conveyor. "Box, Countershaft, Conveyor. Engine Indicators, Bachelder. "Indicators, Thompson. "Indicators, Twentieth Century. "Oil. "Replacers. | . 3 | 58 |
| Bolt | . 0 | 17 54 |
| " Per Canyovan | | 57 |
| " Box Countersheft Conveyor | . 3 | 58 |
| Engine Indicators Rachelder | . 0. | 45 |
| " Indicators, Thompson | . i. | 45 |
| " Indicators, Twentieth Century | . ī | 45 |
| " Oil | . : | 23 |
| " Replacers | . 5 | 24 |
| " Room Clocks | . 14 | 43 |
| " and Tender Hose | | 48 |
| " Replacers. " Room Clocks. " and Tender Hose Engineers' Favorite Tube Scrapers. | | 40 |
| Fillers. Gauges Hammers. Levels. Oiler Sets. | . 20 | 08 58 |
| " Uammone | . 0 | Ne. |
| " Levels | . 8 | 64 |
| " Oiler Sets | . 2 | 07 |
| " Rules | . 8 | 66 |
| " Wrenches | 0, 7 | 91 |
| Engines, Cutter | . 9 | 77 |
| " Electric, Foos92 | 26, 9 | 27 |
| " Fire, Chemical | :! | 61 |
| " Gas, Foos923, 92 | 8, 9 | 29 |
| Gasoline, Foos | 55, 9 | 30 |
| " Moring, Lidgerwood |)) -4 ; | 78 |
| " Pumping Fairbanks Morse | . 0 | 61 |
| " Steam Eric City 9: | ti_9: | 36 |
| " Steam, Vertical, O & S | . 9 | 8ŏ |
| " Well, Artesian | . 9 | 63 |
| Enterprise Float Valves | . 10 | 10 |
| Equalizers, Bolt, Perkins | . 110 | 96 |
| Equipments, Gin House | . 113 | 31 |
| rquipoise l'elephone Arms | . 113 86. 6 | 41 |
| " City Food Water Heaters 1" | 10-91 | 71 |
| " City Steam Engines 9 | 81-9: | 36 |
| Escutcheon Pins. Brass | 6 | 41 |
| Eureka Gang Bolters | . 110 | 09 |
| Evaporators, Golden's | . 11 | 35 |
| Everlasting Blow-Off Valves | . 1 | 10 |
| Excelsior Gauge Cocks | . 19 | Ú3 |
| Machines, Self Contained | 11 | 34 |
| Levels. Levels. Oiler Sets. Rules. Wenches. Fingines, Cutter. Electric, Foos. Fire, Chemical. Gas, Foos. Gas, Foos. Gas, Foos. Gas, Foos. Marine. Pumping, Fairbanks-Morse. Steam, Eric City. Steam, Fric City. Steam, Vertical, O&S. Well, Artesian. Enterprise Float Valves. Equipoise Telephone Arms. Equipoise Telephone Arms. Eric City Feed Water Heaters. City Steam Eric City. City Steam Eric City. Steam Bolt. Equipoise Telephone Arms. Evaporators, Golden's. Evelipoide Telephone Arms. Eric City Boilers. Machines, Self Contained. Machines, Self Contained. Washer Cutters. Exbaust Pipe Heads, Burt. Pipe Heads, Champion. Pipe Heads, Champion. Pipe Heads, Swartwout. Expanding Lathe Mandrels, Nicholson. Mandrels, Champion. Mandrels, McCrosky. Expanding Lathe Mandrels. Mandrels, McCrosky. Francisco Bolte. | | 3 (75 |
| " Pine Heads, Champion | 1 | 75 |
| " Pine Heads, Lyman | ់ រំ | 75 |
| " Pipe Heads, Swartwout | ∴ î | 75 |
| Exhausters, Planing Mill, Steel Plate. | 5 | 58 |
| Expanders, Tube | | 44 |
| Expanding Lathe Mandrels, Nicholson | 7 | 39 |
| " Mandrels, Champion " Mandrels, McCrosky | 8 | 31 |
| " Mandrels, McCrosky. Expansion Bolts, Machine | . 8 | 31 30 |
| Lapansion Doits, Machine | . υ | υU |

| | Page |
|--|---|
| Expansion Bolts, Star | .629, 630 |
| " Hook Plates | 309 |
| " Ioint Dine | 237 |
| " Tainta Danas | 137 |
| " Joints, Brass | 131 |
| " Joints, Iron Body | 137 |
| " Joints, Iron Body, Extra Heavy | 138 |
| Reamers | 714 |
| " Ring Pine Hangers | 314 |
| Evalue Sight Feed Lubricators | 192 |
| Extensible Trench Braces | 517 |
| | 317 |
| Extension Beam Trammels | 855 |
| " Dividers | 854 |
| Pipe Hangers | 311 |
| " Sleeves, Friction Clutch, Dodge | 409 |
| " Wall Brackets, Dodge | 428 |
| Freinguisham Fine Chamical | 61 |
| "Wall Brackets, Dodge. Extinguishers, Fire, Chemical. Extra Heavy Brass Valves, Lunkenheime | |
| Extra Heavy Brass valves, Lunkenneimer | 69 |
| " Heavy Cast Iron Fittings 275, 295 | -302, 305 |
| " Heavy Cast Iron Flanges | 272 |
| " Heavy Companion Flanges | 303 |
| " Heavy Flanges and Templates for D | rilling306 |
| Heavy Cast Iron Fittings 275, 295 Heavy Cost Iron Flanges Heavy Companion Flanges Heavy Flanges and Templates for D | 94 |
| neavy Gate valves, fron Body | 190 |
| Heavy Iron Body Expansion Joints. | 138 |
| " Heavy Iron Body Gate Valves | 95 |
| " Heavy Iron Body Valves 84- | 86, 94, 95 |
| " Heavy Malleable Iron Fittings | 255 |
| " Heavy Malleable Iron Unions | 255 |
| " Heavy Maneagle from Chicas | 204 |
| Heavy Heducing Companion Flange | 30 304 |
| | 369 |
| Pliable Hoisting Rope Strong Pipe Extras on Angles on Channels on "!" Beams | 385 |
| " Strong Pipe | . 218, 220 |
| Extras on Angles | 592 |
| " on Channels | 502 |
| U Ul? Danna | 509 |
| on i beams | 092 |
| on rees | |
| Eye Dogs | 564 |
| F | |
| F. and M. Pipe Hangers | 312 |
| Face Plate Jaws, Cushman | 778 |
| race I lace Jaws, Cushidan | |
| | |
| " Plate Jaws, Skinner | |
| " Plate Jaws, Skinner | 772 |
| " Milling Cutter Arbors | 772 735 |
| " Milling Cutter Arbors | 772 735 |
| " Milling Cutter Arbors | 772 735 |
| " Milling Cutter Arbors | 778 772 735 799 |
| Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. | 772 772 735 799 211 |
| Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. | 772 772 735 799 211 |
| Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. | 772 772 735 799 211 |
| Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. | 772 772 735 799 211 |
| Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. | 772 772 735 799 211 |
| Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. | 772 772 735 799 211 |
| " Milling Cutter Arbors " Spanners " Spanners " Arbors " Mutual Tanks " Trucks " Trucks " Scales " Scales " Scales " Scales " Steam Pumps " 952-962 | 778 772 735 799 211 1007 491 1021 494-499 963 964, 965 |
| " Milling Cutter Arbors " Spanners " Spanners " Arbors " Mutual Tanks " Trucks " Trucks " Scales " Scales " Scales " Scales " Steam Pumps " 952-962 | 778 772 735 799 211 1007 491 1021 494-499 963 964,965 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| " Plates, Lathe." " Milling Cutter Arbors." " Spanners." Factory Dispensing Oil Cans. " Mutual Tanks." " Trucks." Fairbanks Fire Hydrants. " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 772 773 779 211 1007 491 1021 494-499 963 964, 965 469 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. Trucks. Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps. Steam Pumps. Faries Tube Cleaners. Fasteners, Belt, Buffalo. Belt, Covell. Hose Strap. Steel, Corrugated Fastenings, Flight, Conveyor. Rail, per Mile. Rail, per Mile. Rail, per Ton. Rope, Wire. Favorite Glass Tube Cutters Fay Patent Calipers. Patent Dividers. Patent Sizes | 775 773 7735 7799 211 1007 491 1021 494 494 494 494 490 302 32 332 641 355 638 638 389 391 157 850 850 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. Trucks. Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps. Steam Pumps. Faries Tube Cleaners. Fasteners, Belt, Buffalo. Belt, Covell. Hose Strap. Steel, Corrugated Fastenings, Flight, Conveyor. Rail, per Mile. Rail, per Mile. Rail, per Ton. Rope, Wire. Favorite Glass Tube Cutters Fay Patent Calipers. Patent Dividers. Patent Sizes | 775 773 7735 7799 211 1007 491 1021 494 494 494 494 490 302 32 332 641 355 638 638 389 391 157 850 850 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. Trucks. Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps. Steam Pumps. Faries Tube Cleaners. Fasteners, Belt, Buffalo. Belt, Covell. Hose Strap. Steel, Corrugated Fastenings, Flight, Conveyor. Rail, per Mile. Rail, per Mile. Rail, per Ton. Rope, Wire. Favorite Glass Tube Cutters Fay Patent Calipers. Patent Dividers. Patent Sizes | 775 773 7735 7799 211 1007 491 1021 494 494 494 494 490 302 32 332 641 355 638 638 389 391 157 850 850 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. Trucks. Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps. Steam Pumps. Faries Tube Cleaners. Fasteners, Belt, Buffalo. Belt, Covell. Hose Strap. Steel, Corrugated Fastenings, Flight, Conveyor. Rail, per Mile. Rail, per Mile. Rail, per Ton. Rope, Wire. Favorite Glass Tube Cutters Fay Patent Calipers. Patent Dividers. Patent Sizes | 775 773 7735 7799 211 1007 491 1021 494 494 494 494 490 302 32 332 641 355 638 638 389 391 157 850 850 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. Trucks. Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps. Steam Pumps. Faries Tube Cleaners. Fasteners, Belt, Buffalo. Belt, Covell. Hose Strap. Steel, Corrugated Fastenings, Flight, Conveyor. Rail, per Mile. Rail, per Mile. Rail, per Ton. Rope, Wire. Favorite Glass Tube Cutters Fay Patent Calipers. Patent Dividers. Patent Sizes | 775 773 7735 7799 211 1007 491 1021 494 494 494 494 490 302 32 332 641 355 638 638 389 391 157 850 850 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks. Trucks. Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps. Steam Pumps. Faries Tube Cleaners. Fasteners, Belt, Buffalo. Belt, Covell. Hose Strap. Steel, Corrugated Fastenings, Flight, Conveyor. Rail, per Mile. Rail, per Mile. Rail, per Ton. Rope, Wire. Favorite Glass Tube Cutters Fay Patent Calipers. Patent Dividers. Patent Sizes | 775 773 7735 7799 211 1007 491 1021 494 494 494 494 490 302 32 332 641 355 638 638 389 391 157 850 850 |
| " Milling Cutter Arbors " Spanners " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. " Trucks. Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 775 7735 7737 7737 7739 211 1007 491 1021 494 494 494 404 404 40 40 40 40 40 40 40 40 40 40 |
| " Milling Cutter Arbors " Spanners " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. " Trucks. Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps. " Steam Pumps | 775 7735 7737 7737 7739 211 1007 491 1021 494 494 494 404 404 40 40 40 40 40 40 40 40 40 40 |
| " Milling Cutter Arbors " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps " Steam Pumps. 952-962 Fall Line Balls. Faries Tube Cleaners. Fasteners, Belt, Buffalo. " Belt, Covell. " Hose Strap. " Steel, Corrugated Fastenings, Flight, Conveyor. " Rail, per Mile. " Rail, per Ton. " Rope, Wire. Favorite Glass Tube Cutters. Fay Patent Dividers Feed Attachments, Wire Rope. " Water Heaters, Cochrane. " Water Heaters, Erie City. " Water Heaters, Erie City. " Water Heaters, Brownlee. " Sight, Independent " Steam, Direct-Acting. " Steam, Twin Engine. | 775 7735 7737 7737 7739 211 1007 491 1021 494 494 494 404 404 40 40 40 40 40 40 40 40 40 40 |
| " Milling Cutter Arbors " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps " Steam Pumps. 952-962 Fall Line Balls. Faries Tube Cleaners. Fasteners, Belt, Buffalo. " Belt, Covell. " Hose Strap. " Steel, Corrugated Fastenings, Flight, Conveyor. " Rail, per Mile. " Rail, per Ton. " Rope, Wire. Favorite Glass Tube Cutters. Fay Patent Dividers Feed Attachments, Wire Rope. " Water Heaters, Cochrane. " Water Heaters, Erie City. " Water Heaters, Erie City. " Water Heaters, Brownlee. " Sight, Independent " Steam, Direct-Acting. " Steam, Twin Engine. | 775 7735 7737 7737 7739 211 1007 491 1021 494 494 499 400 32 32 32 332 533 641 355 638 389 391 157 850 1071 170,171 172,173 1072 200 1074 170,173 1853 |
| " Milling Cutter Arbors " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps " Steam Pumps. 952-962 Fall Line Balls. Faries Tube Cleaners. Fasteners, Belt, Buffalo. " Belt, Covell. " Hose Strap. " Steel, Corrugated Fastenings, Flight, Conveyor. " Rail, per Mile. " Rail, per Ton. " Rope, Wire. Favorite Glass Tube Cutters. Fay Patent Dividers Feed Attachments, Wire Rope. " Water Heaters, Cochrane. " Water Heaters, Erie City. " Water Heaters, Erie City. " Water Heaters, Brownlee. " Sight, Independent " Steam, Direct-Acting. " Steam, Twin Engine. | 775 7735 7737 7737 7739 211 1007 491 1021 494 9963 964 469 40 322 32 32 332 641 335 638 389 391 157 850 1071 172,173 1774 1771,172 200 1074 1073 1074 1074 1074 1074 1074 1074 1074 1074 |
| " Milling Cutter Arbors " Spanners " Spanners " Spanners " Mutual Tanks " Trucks " Trucks " Seales " Fairbanks Fire Hydrants " Seales " Steam Pumps " 952-962 Fairbanks-Morse Power Pumps " Steam Pumps " 952-962 Fall Line Balls Faries Tube Cleaners " Fasteners Belt, Buffalo " Belt, Covell " Hose Strap " Steel, Corrugated " Hose Strap " Steel, Corrugated Fastenings, Flight, Conveyor " Rail, per Mile " Rail, per Ton " Rope, Wire Favorite Glass Tube Cutters Fay Patent Calipers " Patent Calipers " Patent Dividers " Patent Dividers Feed Attachments, Wire Rope " Water Heaters, Cochrane " Water Heaters, Erie City " Water Heaters, Erie City " Water Heaters, Hoppes Feeds, Saw Mill, Steam, Brownlee " Sight, Independent " Steam, Direct-Acting Steam, Twin Engine Feelers Felloe Web Saws | 775 7735 7737 7737 7739 211 1007 491 1021 494 9963 964 469 40 322 32 32 332 641 335 638 389 391 157 850 1071 172,173 1774 1771,172 200 1074 1073 1074 1074 1074 1074 1074 1074 1074 1074 |
| " Milling Cutter Arbors " Spanners " Spanners " Spanners " Mutual Tanks " Trucks " Trucks " Scales Fairbanks-Morse Power Pumps " Steam Pumps " Steam Pumps " Josephale Faries Tube Cleaners Faries Tube Cleaners Fasteners, Belt, Buffalo " Belt, Covell " Hose Strap " Steel, Corrugated Fastenings, Flight, Conveyor " Rail, per Mile " Rail, per Mile " Rail, per Ton " Rope, Wire Favorite Glass Tube Cutters Fay Patent Calipers " Patent Dividers Feed Attachments, Wire Rope " Water Heaters, Cochrane " Water Heaters, Erie City " Water Heaters, Hoppes Feeds, Saw Mill, Steam, Brownlee " Sight, Independent " Steam, Direct-Acting " Steam, Twin Engine Feelers Felloe Web Saws Felt, Deadening Felt, Deadening | 775 7735 7737 7737 7737 7737 7497 1021 494 494 494 499 400 400 400 403 631 641 3555 638 638 157 850 850 870 870 1774 170 1774 177 170 1072 1074 1073 1072 1074 1073 1074 1074 1073 1072 1074 1073 1074 1074 1073 1072 1074 1073 1074 1073 1074 1073 1076 10774 1073 1076 10774 10773 1070 1074 1073 1073 1074 1073 1073 1074 1073 1073 1074 1073 1073 1074 1073 1074 1073 1073 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 1072 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. " Trucks. " Seales Fairbanks Fire Hydrants " Seales Fairbanks-Morse Power Pumps " Steam Pumps. 952-962 Fall Line Balls. Faries Tube Cleaners. Fasteners, Belt, Buffalo. " Belt, Covell. " Hose Strap. " Steel, Corrugated Fastenings, Flight, Conveyor. " Rail, per Mile. " Rail, per Ton. " Rope, Wire. Favorite Glass Tube Cutters. Fay Patent Calipers. " Patent Dividers Feed Attachments, Wire Rope. " Water Heaters, Cochrane. " Water Heaters, Leie City " Sight, Independent " Steam, Direct-Acting. " Steam, Twin Engine. Feelers Felloe Web Saws Felt, Deadening. " Hair | 775 7735 7737 7737 7739 211 1007 491 1021 494-499 40 32 32 32 332 611 355 638 389 391 157 850 1071 172, 173 172, 173 1073 1074 1073 800 1074 1073 800 1074 1073 800 1074 1073 800 1074 1073 800 1074 1073 800 1074 1073 800 1074 1073 800 1074 1073 1074 1073 800 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 1074 1073 |
| " Milling Cutter Arbors " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps " Steam Pumps. 952-962 Fall Line Balls. Faries Tube Cleaners. Fasteners, Belt, Buffalo. " Belt, Covell. " Hose Strap. " Steel, Corrugated Fastenings, Flight, Conveyor. " Rail, per Mile. " Rail, per Mile. " Rail, per Ton. " Rope, Wire. Favorite Glass Tube Cutters. Fay Patent Dividers. " Patent Dividers. " Patent Dividers. " Water Heaters, Crochrane. " Water Heaters, Erie City. " Water Heaters, Hoppes Feeds, Saw Mill, Steam, Brownlee. " Sight, Independent " Steam, Direct-Acting. " Steam, Twin Engine. Feellee Web Saws Felloe Web Saws Felloe Web Saws Felloe Hair " Roofing. | 775 7735 7737 7737 7737 7739 211 1007 491 1021 494 499 400 400 32 32 53 641 355 638 638 389 391 157 850 850 870 1071 170,171 171,171 170,171 170,171 170,171 170,171 170,171 170,171 170,171 1070 1074 1073 858 1032 188 602 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks Trucks Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps Steam Pumps Faries Tube Cleaners Fasteners, Belt, Buffalo Belt, Covell Hose Strap Group Steel, Corrugated Fastenings, Flight, Conveyor Rail, per Mile Rail, per Ton Rope, Wire Favorite Glass Tube Cutters Fay Patent Calipers Patent Calipers Water Heaters, Cochrane Water Heaters, Erie City Water Heaters, Hoppes Feed, Attachments, Wire Rope Steam, Direct-Acting Steam, Direct-Acting Steam, Direct-Acting Fellow Wab Saws Felt, Deadening Hair Roofing Tarred Tarred | 775 7735 7737 7737 7737 7739 211 1007 491 1021 494-499 400 302 302 302 303 303 303 303 303 303 3 |
| " Milling Cutter Arbors " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps. " Steam Pumps. 952-962. Fall Line Balls. Faries Tube Cleaners. Fasteners, Belt, Buffalo. " Belt, Covell. " Hose Strap. " Steel, Corrugated Fastenings, Flight, Conveyor. " Rail, per Mile. " Rail, per Mile. " Rail, per Ton. " Rope, Wire. Favorite Glass Tube Cutters. Fay Patent Dividers. " Patent Dividers. " Patent Dividers. " Water Heaters, Crochrane. " Water Heaters, Crochrane. " Water Heaters, Lrie City. " Water Heaters, Hoppes Feeds, Saw Mill, Steam, Brownlee. " Sight, Independent " Steam, Direct-Acting. " Steam, Twin Engine. Feelers Fell, Deadening. " Hair " Roofing. " Tarred. Feene Noile. | 775 7735 7737 7737 7737 7739 2111 1007 491 1021 494 9963 964 469 400 322 32 32 332 332 332 333 641 3357 850 1071 172, 173 1072 200 1074 170, 171 172, 173 1074 1074 1074 1074 1074 1074 1074 1074 |
| " Milling Cutter Arbors " Spanners Factory Dispensing Oil Cans. " Mutual Tanks. " Trucks. " Trucks. " Scales Fairbanks Fire Hydrants " Scales Fairbanks-Morse Power Pumps " Steam Pumps | 775 7735 7737 7737 7737 7739 211 1007 497 1021 494-499 404 404 32 32 32 332 533 641 355 638 389 391 157 850 1071 170,171 172,173 1072 200 1074 1073 1073 1073 1073 1073 1073 1074 1073 1073 1074 1073 1073 1074 1073 1074 1073 1074 1073 1074 1074 1074 1075 1076 1077 1076 1077 1077 1078 1078 1078 1088 1088 1088 |
| Plates, Lathe Milling Cutter Arbors Spanners Factory Dispensing Oil Cans. Mutual Tanks Trucks Fairbanks Fire Hydrants Scales Fairbanks-Morse Power Pumps Steam Pumps Steam Pumps Faries Tube Cleaners Fasteners, Belt, Buffalo Belt, Covell Hose Strap Group Steel, Corrugated Fastenings, Flight, Conveyor Rail, per Mile Rail, per Ton Rope, Wire Favorite Glass Tube Cutters Fay Patent Calipers Patent Calipers Water Heaters, Cochrane Water Heaters, Erie City Water Heaters, Hoppes Feed, Attachments, Wire Rope Steam, Direct-Acting Steam, Direct-Acting Steam, Direct-Acting Fellow Wab Saws Felt, Deadening Hair Roofing Tarred Tarred | 775 7735 7737 7737 7737 7739 211 1007 491 1021 494-499 400 302 302 302 303 303 303 303 303 303 3 |

| | · · · · · · · · · · |
|---|---|
| Sheets | • • • • • • • • • • |
| Tubing | • • • • • • • • • |
| rigures, Pattern | |
| Fibre Rods. "Sheets. "Tubing Figures, Pattern "Steel. File Cards. "Handles. Filers' Tools, Saw. "Vises. Files. "Saw, Disston. "Swiss Pattern Filing Machines, Saw, Band. "Room Machinery. "Setting Apparatus, Bane Filler, Belt. Fillers, Engineers'. Fillet Tools. "Leather. Wood Filters, Oil, White Star Fine Nails Finished Brass Fittings. "Raws Unions | |
| " Handles | |
| Filers' Tools, Saw | |
| " Vises | |
| Files | · · · · · · · · · · · · |
| Saw, Dission | • • • • • • • • • |
| Filing Machines Saw Band | |
| " Room Machinery | 1 |
| " Setting Apparatus, Banc | l Saw |
| Filler, Belt | |
| Fillers, Engineers | • • • • • • • • • |
| " Losthur | |
| " Wood | |
| Filters, Oil, White Star | |
| Fine Nails | |
| Finished Brass Fittings | |
| Brass Unions | |
| " Your Split Pulleys, Dodg | ю |
| " Traction Wheels | |
| Finishers' Vises | |
| Fine Nails Fine Nails Finished Brass Fittings Brass Unions Finished Brass Unions Finishers Vises Finishing Nails Taper Reamers | |
| " Taper Reamers | |
| " Trowels | |
| Fire Bricks | |
| " Buckets | |
| " Extinguishers Chemical | |
| " Hydrants, Fairbanks | |
| " Jumpers | |
| " Pumps, Fiarbanks-Mors | e |
| Pumps, Power Rotary, I | łumsey |
| Firm Loint Coliners | |
| Fisher Leg Vises | |
| " Pump Governors | |
| " Reducing Valves | . <i></i> |
| Fittings, Ammonia | |
| Bollers Malleable Iron. | |
| " Brass Einished | |
| " Renor Donal. | |
| | |
| " Cast Iron, Extra Heavy, | 275, 295 |
| Finishing Nails " Taper Reamers " Trowels Fire Bricks " Bucket Tanks " Extinguishers, Chemical " Hydrants, Fairbanks " Jumpers " Pumps, Fiarbanks-Mors " Pumps, Fiarbanks-Mors, " Pumps, Power Rotary, I Firemen's Axes Firm Joint Calipers Fisher Leg Vises " Pump Governors " Reducing Valves Fittings, Ammonia " Boilers Mallicable Iron " Brass, Cast Iron Pattern " Brass, Finished " Brass, Rough Cast Iron, Extra Heavy, " Cast Iron, Flanged, Extra | 275, 295 Heavy 29 |
| " Cast Iron, Extra Heavy, Cast Iron, Flanged, Extra " Cast Iron, Flanged, Stan | 275, 295 Heavy 29. dard |
| Cast Iron, Extra Heavy, Cast Iron, Flanged, Extra Cast Iron, Flanged, Stan Cast Iron, Hydraulic | . 275, 295 Heavy 29. dard |
| Cast Iron, Extra Heavy, Cast Iron, Flanged, Extra Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Long Sweep. Cast Iron, Sorrand Extra | 275, 295 Heavy 29 dard |
| Cast Iron, Extra Heavy, Cast Iron, Flanged, Extra Cast Iron, Flanged, Extra Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Serewed, Extra Cast Iron, Serewed, Lon | 275, 295 Heavy 29 dard |
| Cast Iron, Extra Heavy, Cast Iron, Elanged, Extra Cast Iron, Flanged, Stan Cast Iron, Hydraulie Cast Iron, Long Sweep, Cast Iron, Serewed, Lox Cast Iron, Serewed, Lox Cast Iron, Serewed, Star | 275, 295 Heavy 29 dard a Heavy g Sweep |
| Cast Iron, Extra Heavy, Cast Iron, Elanged, Extra Cast Iron, Flanged, Extra Cast Iron, Flanged, Stan Cast Iron, Long Sweep, Cast Iron, Serewed, Extr Cast Iron, Serewed, Lon Cast Iron, Serewed, Star Cast Iron, Szewed, Star Cast Iron, Szewed, Star | 275, 295 Heavy 29 dard a Heavy g Sweep |
| Cast Iron, Extra Heavy, Cast Iron, Elanged, Extra Cast Iron, Flanged, Stan Cast Iron, Hydraulie Cast Iron, Long Sweep, Cast Iron, Serewed, Extra Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Szes of Cast Iron, Szes of Cast Iron, Szes of | 275, 295 Heavy 29 dard a Heavy g Sweep |
| Cast Iron, Extra Heavy, Cast Iron, Extra Heavy, Cast Iron, Flanged, Extra Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Serewed, Cast Iron, Serewed, Star Cast Iron, Seecal | 275, 295 Heavy 29. dard a Heavy g Sweep dard |
| Cast Iron, Extra Heavy, Cast Iron, Extra Heavy, Cast Iron, Flanged, Extra Cast Iron, Flanged, Stan Cast Iron, Hydraulie Cast Iron, Serewed, Extra Cast Iron, Serewed, Extra Cast Iron, Serewed, Extra Cast Iron, Serewed, Stan Cast Iron, Serewed, Stan Cast Iron, Serewed, Cast Cast Iron, Serewed, Cast Cast Iron, Special Cast Iron, Standard, Corner Eccentric Cast Iron | 275, 295 Heavy 29. dard a Heavy g Sweep dard 260-271 |
| Cast Iron, Extra Heavy, Cast Iron, Elanged, Extra Cast Iron, Flanged, Extra Cast Iron, Flanged, Extra Cast Iron, Long Sweep, Cast Iron, Serewed, Extra Cast Iron, Serewed, Extra Cast Iron, Serewed, Extra Cast Iron, Serewed, Star Cast Iron, Sizes of Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, for Phesphate | 275, 295 Heavy 29. dard a Heavy g Sweep dard 260-272 |
| Cast Iron, Extra Heavy, Cast Iron, Extra Heavy, Cast Iron, Flanged, Extra Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Seesad, Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Jor Phesphate; Flanged, Jor Phesphate; Flanged, Jor Phesphate; | 275, 295 Heavy, 29, dard a Heavy g Sweep dard 260-272 Mining Spiral |
| Cast Iron, Extra Heavy, Cast Iron, Elanged, Extra Cast Iron, Flanged, Extra Cast Iron, Flanged, Star Cast Iron, Hydraulie Cast Iron, Serewed, Extra Cast Iron, Serewed, Extra Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Standard, Cast Iron, Standard, Corner Eccentric, Cast Iron Flanged, Or Phosphate Flanged, Pipes for Drill Flanged, Prices for Drill | 275, 295 Heavy, 29, dard Ta Heavy g Sweep dard 260-272 Mining Spiral ng |
| Cast Iron, Extra Heavy, Cast Iron, Elanged, Extra Cast Iron, Flanged, Extra Cast Iron, Flanged, Extra Cast Iron, Long Sweep, Cast Iron, Serewed, Long Cast Iron, Serewed, Extra Cast Iron, Serewed, Star Cast Iron, Sizes of Cast Iron, Sizes of Cast Iron, Special Cast Iron, Standard, Corner Eccentric, Cast Iron Flanged, for Phesphate Flanged, Prices for Drilli Foot Rail | 275, 295 Heavy, 29, dard Ta Heavy g Sweep dard 260-272 Mining Spiral |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Extr Cast Iron, Serewed, Extr Cast Iron, Serewed, Stan Cast Iron, Serewed, Stan Cast Iron, Special Cast Iron, Standard Corner Eccentric, Cast Iron Flanged, for Phesphate Flanged, Pipe, Riveted, Flanged, Prices for Drilli Foot Rail Henry | dard |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Extr Cast Iron, Serewed, Extr Cast Iron, Serewed, Stan Cast Iron, Serewed, Stan Cast Iron, Special Cast Iron, Standard Corner Eccentric, Cast Iron Flanged, for Phesphate Flanged, Pipe, Riveted, Flanged, Prices for Drilli Foot Rail Henry | dard |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Extr Cast Iron, Serewed, Extr Cast Iron, Serewed, Stan Cast Iron, Serewed, Stan Cast Iron, Special Cast Iron, Standard Corner Eccentric, Cast Iron Flanged, for Phesphate Flanged, Pipe, Riveted, Flanged, Prices for Drilli Foot Rail Henry | dard |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Irop, Riveted, Flanged, Prices for Drilli Foot Rail Hose Malleable Iron, Malleable Iron, Malleable Iron, Hydraul Malleable Iron, Hydraul | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Irop, Riveted, Flanged, Prices for Drilli Foot Rail Hose Malleable Iron, Malleable Iron, Malleable Iron, Hydraul Malleable Iron, Hydraul | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Irop, Riveted, Flanged, Prices for Drilli Foot Rail Hose Malleable Iron, Malleable Iron, Malleable Iron, Hydraul Malleable Iron, Hydraul | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Irop, Riveted, Flanged, Prices for Drilli Foot Rail Hose Malleable Iron, Malleable Iron, Malleable Iron, Hydraul Malleable Iron, Hydraul | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Irop, Riveted, Flanged, Prices for Drilli Foot Rail Hose Malleable Iron, Malleable Iron, Malleable Iron, Hydraul Malleable Iron, Hydraul | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Irop, Riveted, Flanged, Prices for Drilli Foot Rail Hose Malleable Iron, Malleable Iron, Malleable Iron, Hydraul Malleable Iron, Hydraul | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Lon, Cast Iron, Serewed, Star Cast Iron, Serewed, Star Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Special Cast Iron, Standard Corner Eccentric Cast Iron Flanged, Irop, Riveted, Flanged, Prices for Drilli Foot Rail Hose Malleable Iron, Malleable Iron, Malleable Iron, Hydraul Malleable Iron, Hydraul | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |
| Cast Iron, Flanged, Stan Cast Iron, Hydraulic Cast Iron, Hydraulic Cast Iron, Long Sweep, Cast Iron, Serewed, Extr Cast Iron, Serewed, Extr Cast Iron, Serewed, Stan Cast Iron, Serewed, Stan Cast Iron, Special Cast Iron, Standard Corner Eccentric, Cast Iron Flanged, for Phesphate Flanged, Pipe, Riveted, Flanged, Prices for Drilli Foot Rail Henry | dard. a Heavy g Sweep ddard. 260-272 Mining Spiral. ng. |

| | Page |
|--|-----------------|
| Flange Lifters, Moulders' Unions, Brass Unions, Cast Iron Unions, Cast Iron, Extra Heavy Unions | 575 |
| " Unions, Brass | 321 |
| Unions, Brass Unions, Cast Iron, Extra Heavy Unions, Cast Iron, Extra Heavy Unions, Kewanee Unions, Malleable Iron Flanged Fittings, Cast Iron, Extra Heavy Fittings, Cast Iron, Extra Heavy Fittings, Pipe, Riveted, Spiral Pipe, Cast Iron, Dodge Shafting Couplings, Bond Valves and Fittings, Drilling, Pric Flanges, Angle, Slotted, Cast Iron Boiler, Steel Cast Iron, Extra Heavy Circular, Cast Iron Common, Cast Iron Companion, Reducing, Extra Heavy Companion, Reducing, Extra Heav Companion, Reducing, Extra Heav Companion, Reducing, Standard Floor, Cast Iron Moulders Pipe, Riveted, Spiral Flanges and Beads, Moulders' and Templates for Drilling, Extra F and Templates for Drilling, Stand Flap Valves, Centrifugal Pump Flat Boxes, Bond Gaskets, Semibronse Handle S Wrenches Iron, Weight of Nose Pliers Rail Trolleys Rolled Steel Bars, Weight of Spring Keys Twist Drills, Novo High Speed | 270 |
| " Unions Kewanee | 270 |
| " Unions, Malleable Iron | 27ŏ |
| Flanged Fittings, Cast Iron, Extra Heavy | . 295-302, |
| | 305 |
| Fittings, Cast Iron, Standard | 282-293 |
| " Fittings, Pipe, Riveted, Spiral | 934 |
| " Pine Cast Iron | 235 |
| " Pulleys, Cast Iron, Dodge | 405 |
| " Shafting Couplings, Bond | 411 |
| Valves and Fittings, Drilling, Pric | es for 307 |
| Flanges, Angle, Slotted, Cast Iron | 271 |
| " Cast Iron Extra Heavy | 279 |
| " Circular, Cast Iron | 272 |
| " Common, Cast Iron | 272 |
| " Companion, Extra Heavy | 303 |
| "Companion, Reducing, Extra Hea | vy 304 |
| " Companion, Reducing, Standard | 292 |
| " Floor Cost Iron | 279 |
| " Moulders' | 575 |
| " Pipe, Riveted, Spiral | 230, 232 |
| Flanges and Beads, Moulders' | 577 |
| and Templates for Drilling, Extra I | leavy. 306 |
| and Templates for Drilling, Stand | ard 294 |
| Flat Royan Rond | 423 |
| " Gaskets, Semibronse | 15 |
| " Handle S Wrenches | 793, 794 |
| " Iron, Weight of | 588 |
| Nose Pliers | 873 |
| " Rail Trolleys | 452 |
| " Spring Keys | 389, 390 845 |
| " Twist Drills, Novo High Speed | 710 |
| Rolled Steel Bars, Weight of Spring Keys. Twist Drills, Novo High Speed. Flatters, Blacksmitha'. Flax Coil Packing, Phosphate Brand Packing, Square, Chicora. Packing, Square, Commercial Packing, Square, It Edge Packing, Square, Navy Packing, Square, Standard, Flexible Ball Joints. Cement Roofing, Carey Joints, Cast Iron Flight Supports, Conveyor Flint Paper Valves, Foster Valves, Foster Valves, Tank Floats, Tank | 542 |
| Flax Coil Packing, Phosphate Brand | 8 |
| " Packing, Square, Chicora | 9 |
| " Packing Square Gilt Edge | 9 |
| " Packing, Square, Navy | |
| " Packing, Square, Standard, | 17 |
| Flexible Ball Joints | 237 |
| " Cement Roofing, Carey | 600 |
| Flight Supports Conveyor | 355 |
| Flint Paper | 672 |
| Float Valves, Davis | 128 |
| " Valves, Foster | 128 |
| " Valves, Tank | 1010 |
| " Valves, Tank Ploats, Tank Ploats, Tank Ploor Chisels. " Flanges, Cast Iron. " Plates, Brass. " Plates, Cast Iron. " Stands, Dodge. " Take-Ups. Flooring Nails. Fluc Cleaners. Fluted Chucking Reamers. Folders, Bar, Keystone. " Iron, Sheet. " Pipe. Folding Rules. | 1010 |
| " Flanges Cast Iron | 279 |
| " Plates, Brass | |
| " Plates, Cast Iron | 315 |
| "Stands, Dodge | 427 |
| " Take-Ups | 363 |
| Flooring Nails | 40-42 |
| Fluted Chucking Reamers | 715-717 |
| Folders, Bar, Keystone | 882 |
| " Iron, Sheet | 880-882 |
| " Pipe | 880 |
| " Steel Posket Rules | 866 227 |
| Foos Electric Engines | 926 927 |
| " Gas Engines | 3, 928, 929 |
| " Gasoline Engines 922, 92 | 4, 925, 930 |
| Foot Blocks, Derrick | 467 |
| " Kail Fittings | 259 |
| " Valves Centrifugal Pump | 97 |
| " Valves, Emerson | 98 |
| " Valves, Iron Body | 97 |
| " Pipe Folding Rules " Steel Pocket Rules " Steel Pocket Rules " Gas Engines | 1083 |

| | | | F | age |
|-------------|--|----------------|------------|-------------------|
| Forb | es Patent Pipe Threading Machines e Pump Standards. Pumps, Double Acting. Pumps, Hand. Pumps, House. Pumps, Rumsey. Pumps, Thresher 's Ship Augers. es, Blacksmiths'. Boilermakers' Brazing. Compressed Air Machinists' Portable, Buffalo Rivet. | | | 808 |
| Fore | Pump Standards | · ne | <u>.</u> . | 983 |
| •• | Pumps, Double Acting | . 96 | 3 | 084 |
| ** | Pumps, House | .98 | 7. | 988 |
| •• | Pumps, Rumsey990 | , 99 | 5, | 996 |
| | Pumps, Thresher | | | 985 |
| Ford | 's Ship Augers | | • | 572 |
| rorg | Poilormakers' | | ٠. | 552 |
| | Brazing | | i | 059 |
| •• | Compressed Air | | | 554 |
| ** | Machinists' | · · <u>· ·</u> | : | 552 |
| | Portable, Buffalo | . 55 | 2- | 554 |
| Form | Kivet | . 33 | 2- | 470 |
| roig | Portable, Buffalo. Rivet. ings, Derrick. Handle, Machine. s, Ballast. Coke. Cotton Seed. Rail. Sawdust. | | • | 832 |
| Fork | s, Ballast | | | 505 |
| ** | Coke | | | 505 |
| •• | Cotton Seed | | | 505 |
| | Rail | | ٠. | 505 |
| | | | | |
| Form | Stone | s | . 1 | 141 |
| 45° A | Ingle Railing Fittingser Float Valves | | | 259 |
| Foste | er Float Valves | | | 128 |
| n" | Pressure Regulating Valves | | | 121 |
| Foun | Crosso Twist Drills | 70 | i | 488 705 |
| Four | -Way Drain Air Valves | | ٠, | 99 |
| Fran | es. Binder. Dodge | | | 429 |
| - 1,,,,,,,, | Grindstone | | | 677 |
| - " | Saw, Hack | ٠:: | ÷ | 534 |
| Frict | ion Clutch Couplings, Dodge | .40 | 7, | 408 |
| ** | Clutch Couplings, M. & W | • • • | ٠. | 400 |
| ** | Cut-Off Counlings, Dodge | 40 | Ż. | 408 |
| " | Cut-Off Couplings, M. & W | | | 406 |
| •• | Log Haul-Ups | | . 1 | 081 |
| | of Water in Pipes | | . 1 | 139 |
| Frict | ngle Railing Fittings or Float Valves or Float Valves Pressure Regulating Valves dry Barrows Groove Twist Drills Way Drain Air Valves ese, Binder, Dodge Grindstone Saw, Hack ion Clutch Couplings, Dodge Clutch Couplings, M. & W. Clutch Extension Sleeves, Dodge Cut-Off Couplings, Modge Cut-Off Couplings, M. & W. Log Haul-Ups of Water in Pipes ions, Paper S. Oil Burners. Oil Pumping Apparatus | ٠. ٠ | • | 432 539 |
| Frog | Oil Burnara | ٠.٠ | • | องช 949 |
| 1 461 | Oil Pumping Apparatus | · · · | : | 949 |
| Fulle | Oil Pumping Apparatus. rs, Blacksmiths' sels. aces, Gasoline. Melting, Lead. Melting, Tar. Safety. | | | 542 |
| Funn | iels <u>.</u> | | | 210 217 516 |
| Furn | aces, Gasoline | | | 217 |
| ** | Melting, Lead | | ٠ | 516 |
| Fuse | Safety | | • | 571 |
| Fusil | le Pluge Marine | | : | 158 |
| | G | | | |
| GAD | Tongs | | ٠. | 543 |
| Gain | ing Cutters | • • • | . 1 | 037 |
| Gail | Iron Wire Rope | • • • | . 1 | 387 |
| ** | Oily Waste Cans | | | 211 |
| ** | Pipe | . 21 | 9, | 220 |
| ** | Railing Fittings | . 25 | 6, | 257 |
| ** | Sash Cord | ٠ | • | 387 |
| ** | Sheets Crimped | | • | 606 |
| ** | Steel Wire Strand | | | 388 |
| Gang | Bolters | | . 1 | 109 |
| 44 | Edgers, Curtis | | . 1 | 075 |
| ** | anized Floats Iron Wire Rope Oily Waste Cans Pipe Railing Fittings Sash Cord Sheets Sheets Crimped Steel Wire Strand (Rolters Edgers, Curtis Lath Mills Planer Tools, Armstrong en Hose | | . 1 | 109 |
| | en Hose | ٠., | • | 824 45 |
| Gard | en Hose | | : | 74 |
| Gard | ner Belt Clamps | | : | 36 |
| ** | Governors | | | 134 |
| <u> </u> | Pump Governors | | | 131 |
| Garn | et Cloth | | • | 673 673 |
| Gna | en Hose Hose Valves ner Belt Clamps Governors Pump Governors et Cloth Paper Engine Lubricators Engine Lubricators 923 | | • | 102 |
| 11 | Engines, Foos 923 | , 92 | 8. | 929 |
| • • | et Cloth. Paper. Engine Lubricators. Engines, Foos. 923 Meter Cocks, Brass. Pipe. Pipe Hooks. Pilers. | | | 107 |
| | Pipe | . 21 | 9, | 220 |
| | Pipe Hooks | | ٠ | 310 |
| | # HE18 | | ٠ | 010 |

| | | Page |
|---------|---|--|
| Gask | et Cutters, Rose tets, Copper, Solid, Corrugated Flat, Semibronze. Tubular, Red, Ideal. Tubular, Semibronze. line Engine Dynamos. Engines, Foos. 922, 924, 925 Furnaces. 922, 924, 925 Furnaces. Motor Cars. Torches Cutters, Moulders'. Hinges, Self Closing. Valves, Brass, Hose. Valves, Brass, Hose. Valves, Brass, Jenkins Valves, Brass, Pratt & Cady. Valves, Brass, Quick Opening. Valves, Brass, Standard. Valves, Clip, Lunkenheimer. Valves, Clip, Lunkenheimer. Valves, Iron Body, Extra Heavy. | 869 |
| Gask | ets, Copper, Solid, Corrugated | 308 |
| •• | Tubular Red Ideal | 13 |
| ** | Tubular, Semibronse | 16 |
| Gasc | line Engine Dynamos | 1119 |
| ** | Engines, Foos | 6, 930 |
| ** | Furnaces | 217 |
| | Motor Cars | 537 |
| 0-4- | Cotton Mouldon' | 210 |
| Gare | Hinges Self Closing | 257 |
| ** | Valves, Brass, Hose | 76 |
| •• | Valves, Brass, Jenkins | 77 |
| ** | Valves, Brass, Lunkenheimer | 77 |
| ** | Valves, Brass, Pratt & Cady | . 77 |
| " | Valves, Brass, Quick Opening | - 49 |
| ** | Valves Brees Standard | 76 |
| | Valves, Clip. Lunkenheimer | 91 |
| ** | Valves, Iron Body, Extra Heavy9 | 4. 95 |
| | Valves, Clip, Lunkenheimer. Valves, Iron Body, Extra Heavy. Valves, Iron Body, Lunkenheimer. Valves, Iron Body, Lunkenheimer. Valves, Iron Body, Outside Screw and | 90 |
| ** | Valves, Iron Body, Lunkenheimer 9 | 1, 92 |
| •• | Valves, Iron Body, Outside Screw and | 1 00 |
| | Values Jaco Dady Prott & Cody | 93 |
| | Valves Iron Body, Fratt & Cady | 93 |
| ** | Valves, Iron Body, Standard | 88. 89 |
| ** | Valves, Lever, Brass, Handy, Lunken- | |
| | Valves, Iron Body, Outside Screw and Yoke Yoke Valves, Iron Body, Pratt & Cady Valves, Iron Body, Spur Geared Valves, Iron Body, Standard Valves, Lever, Brass, Handy, Lunkenheimer Valves, Lever, Iron Body, Handy Lunkenheimer ge Attachments, Height Attachments, Surface Check Valves, Hydraulic Cocks, Ball Cocks, Compression Cocks, Excelsior Cocks, Mississippi Cocks, Wississippi Glass Washers | . 75 |
| •• | Valves, Lever, Iron Body, Handy | |
| | Lunkenheimer | 97 |
| Gau | ge Attachments, Height | 860 |
| ** | Check Velves Hydraulic | 104 |
| ** | Cocks 102 | 2. 103 |
| •• | Cocks, Ball | 103 |
| ** | Cocks, Compression | 103 |
| ** | Cocks, Excelsior | 103 |
| | Cocks, Mississippi | 103 |
| •• | Close Washers | $\frac{103}{158}$ |
| ** | Glasson | 157 |
| ** | Glasses, Reflecting, Red | 157 |
| •• | Hand Pullers, Steam | 101 |
| " | Sizes, U. S., Diagram of | |
| | Syphons, Steam | 583 |
| Com | 75 | 583 104 |
| | Testers, American | 583 104 144 |
| 0.,,,,, | Cocks, Mississippi. Corks, Pittsburgh. Glasse S. Glasses. Glasses. Glasses, Reflecting, Red Hand Pullers, Steam Sizes, U. S. Diagram of Syphons, Steam Testers, American ges, Air Brake | 583 104 144 142 |
| 01111 | Testers, American | 583 104 144 142 140 142 |
| " | Testers, American ges, Air Brake Altitude Ammonia Caliper, Adjustable | 583 104 144 142 140 142 849 |
| | Testers, American. ges, Air Brake. Altitude. Ammonia Caliper, Adjustable. Çaliper, Micrometer. | 583 104 144 142 140 142 849 849 |
| | Testers, American. ges, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating | 583 104 144 142 140 142 849 849 142 |
| | Testers, American, ges, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating Center. Circumference | 583 104 144 142 140 142 849 849 142 857 |
| | Testers, American, ges, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating Center Circumference Combination 146 | 583 104 144 142 140 142 849 849 142 857 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia. Caliper, Adjustable. Calper, Micrometer. Car Heating. Center Circumference. Combination | 583 104 144 142 140 142 849 849 142 857 844 0, 154 |
| | Testers, American, ges, Air Brake. Altitude Ammonia Caliper, Adjustable Car Heating Center Circumference Combination 146 Depth Drill | 583 104 144 142 140 142 849 849 142 857 844 0, 154 858 |
| | Testers, American, ges, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating Center. Circumference Combination 140 Depth Drill Engineers' | 583 104 144 142 140 142 849 849 142 857 844 0, 154 858 856 |
| | Testers, American, ges, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating Center Circumference Combination 140 Depth Drill Engineers' Hydraulie | 583 104 144 142 140 142 849 849 142 854 0, 154 858 856 858 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center Circumference. Combination | 583 104 144 142 140 142 849 849 142 854 854 858 856 858 140 |
| | Testers, American, ges, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating Center. Circumference Combination 146 Depth Drill Engineers' Hydraulic Lucomotive Lumber Less Air Brakes Late | 583 104 144 142 140 142 849 849 142 857 844 0, 154 858 140 142 568 |
| | Testers, American, ges, Air Brake. Altitude. Altitude. Anmonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center. Circumference. Combination | 583 104 144 142 140 142 849 849 142 857 844 0, 154 858 140 142 568 141 148 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center Circumference. Combination | 583 104 144 142 140 142 849 849 142 854 568 856 856 142 568 148 149 |
| | Testers, American, ges, Air Brake. Altitude. Anmonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center. Circumference. Combination 146 Depth Drill Engineers' Hydraulic. Lucomotive. Lumber Pressure, Recording, Bristol. Pressure, Recording, Pittsburgh. Pyrometer. | 583 104 144 142 140 142 849 849 857 858 858 140 142 568 141 148 149 140 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center. Circumference. Combination | 583 104 144 142 140 142 849 849 857 856 858 140 142 856 858 140 148 149 857 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Adjustable. Caliper, Micrometer Car Heating Center. Circumference. Combination | 583 104 144 142 849 142 857 857 858 858 858 140 142 148 149 140 141 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center. Circumference. Combination 146 Depth. Drill Engineers' Hydraulie. Locomotive. Lumber. Pressure, Recording, Bristol. Pressure, Recording, Pittsburgh. Pyrometer. Screw Pitch. Steam. Steam. | 583 104 144 142 849 142 857 857 858 858 858 140 142 568 140 141 149 140 141 141 142 148 149 140 141 141 141 142 148 148 148 148 148 148 148 148 148 148 |
| | Testers, American, gees, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating Center. Circumference Combination 140 Depth Drill Engineers' Hydraulic Lucomotive Lumber Pressure, Recording, Bristol Pressure, Recording, Pittsburgh Pyrometer Screw Pitch Steam Steam Heat Surface. Tap. | 583 104 144 142 140 849 849 857 568 858 568 140 142 149 149 140 857 141 149 857 141 142 856 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center. Circumference. Combination | 583 104 144 142 142 849 849 142 857 858 858 858 140 856 858 141 149 149 140 857 141 140 857 141 140 857 141 140 857 141 141 141 141 141 141 141 141 141 14 |
| | Testers, American, ges, Air Brake. Altitude Ammonia Caliper, Adjustable. Caliper, Micrometer Car Heating. Center. Circumference. Combination 146 Depth Drill Engineers' Hydraulie. Locomotive. Lumber. Pressure, Recording, Bristol. Pressure, Recording, Pittsburgh. Pyrometer. Screw Pitch Steam Steam Steam Heat Surface. Tap. Taper Wire and Thickness, Engineers' Test. | 583 104 144 142 140 142 149 819 819 849 857 844 858 858 858 858 142 142 149 149 149 149 149 149 149 149 149 149 |
| | Testers, American, gees, Air Brake. Altitude Ammonia Caliper, Adjustable Caliper, Micrometer Car Heating Center. Circumference Combination 146 Depth Drill Engineers' Hydraulic Lucomotive Lumber Pressure, Recording, Bristol Pressure, Recording, Pittsburgh Pyrometer Screw Pitch Steam Steam Heat Surface Tap. Taper Wire and Thickness, Engineers' Test, Inspectors' | 583 1044 1442 1440 1440 849 849 857 8544 1, 8588 856 858 140 141 148 857 141 148 857 141 148 857 141 148 857 141 148 857 141 148 857 149 149 149 149 149 149 149 149 149 149 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Micrometer Car Heating Center. Circumference Combination 146 Depth Drill Engineers' Hydraulic Locomotive Lumber Pressure, Recording, Bristol Pressure, Recording, Pittsburgh Pyrometer Serew Pitch Steam Steam Steam Steam Steam Tap. Tuper Wire and Thickness, Engineers' Test. Trest. Trest. | 583 1044 1442 1440 1440 1440 1849 1451 1451 1451 1451 1451 1451 1451 14 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Micrometer Car Heating. Center. Circumference Combination 146 Depth Drill Engineers' Hydraulie Locomotive Lumber Pressure, Recording, Bristol Pressure, Recording, Pittsburgh Pyrometer. Screw Pitch Steam Steam Heat Sturface. Tap. Taper Wire and Thickness, Engineers' Test, Inspectors' Trest, Inspectors' Trest, Inspectors' Track, Huntington | 583 104 142 140 142 849 849 857 142 857 140 158 858 140 141 149 149 149 149 149 149 149 149 149 |
| | Testers, American, ges, Air Brake. Altitude. Ammonia Caliper, Micrometer. Car Heating. Center. Circumference. Combination 146 Depth Drill Engineers' Hydraulic Lucomotive Lumber. Pressure, Recording, Bristol Pressure, Recording, Pittsburgh Pyrometer Screw Pitch Steam Steam Heat Surface. Tap. Tuper Wire and Thickness, Engineers' Trest, Inspectors' Trisck, Huntington Traction Engine. Vacuum | 583 104 142 140 142 849 142 856 858 858 858 140 142 856 142 856 858 858 858 858 858 858 858 858 858 |
| | Syphons. Steam Testers, American. Testers, American. Testers, American. Ses, Air Brake. Altitude Ammonia Caliper, Adjustable. Caliper, Micrometer. Car Heating. Center. Circumference. Combination | 583 104 142 1440 1442 8449 8142 8449 8142 8544 1452 8544 1452 8544 1452 8544 1452 8544 1452 8546 858 858 1442 8656 858 1443 8586 858 1443 8586 1452 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8656 858 1443 1452 8566 858 1443 1452 8566 858 1452 8566 8566 8566 8566 8566 8566 8566 85 |

| Water Pressure. Wire. Gear, Chain, Silent |
|--|
| " Wine |
| Care Chair Silons |
| C I II |
| Geared Hand Blowers, Buffalo |
| Gears, Bevel |
| |
| " Mortise |
| " Spur |
| " Steel, Manganese, Tisco |
| Spur Steel, Manganese, Tisco Gen Hose Nozzles |
| General Purpose Barrows |
| Service Pumps, Fairbanks-Morse Service Wrenches Generators, Willey Genuine Babbitt Metal |
| " Service Wrenghes |
| Generators, Willey |
| Generators, Wiley Genuine Babbitt Metal. Giant Nozzles, Hydraulic Railroad Track Ratchets Socket Wrenches Gilbert's Gauge Glass Protectors. Gilt Edge Gum Core Coil Packing. Edge Sougre Flax Packing. |
| Genuine Babout Metal |
| Giant Nozzles, Hydraulic |
| " Railroad Track Ratchets |
| " Socket Wrenches |
| Gilbert's Gauge Glass Protectors |
| " Gilt Edge Gum Core Coil Packing. |
| " Edge Square Flax Packing Gin Blocks, Wrought Iron |
| Gin Blocks, Wrought Iron |
| " House Equipments |
| Gins, Cotton, Lummus1 |
| " Cotton Platt's |
| Ciala Dalla |
| House Equipments. Gins, Cotton, Lummus. Cotton, Platt's. Girder Drills. |
| Grass Body Sight Feed Lubricators |
| " Oil Cups |
| " Tube Cutters |
| " Washers, Gauge |
| Glasses, Gauge |
| " Gauge, Reflecting, Red |
| " Oil Cup |
| Globe Valves, Brass, Clean Seat |
| " Valves Bruss Jenkins Bros. |
| " Valvoe Brass Lunkenheimer |
| " Values Drass, Nordle Point |
| " Values Draws Standard |
| Valves, Brass, Standard |
| Valves, Iron Body, Extra Heavy |
| |
| vaives, from body, senkins bros |
| " Valves, Iron Body, Lunkenheimer. |
| " Valves, Iron Body, Lunkenheimer " Valves, Iron Body, Standard |
| Glasses, Gauge. " Gauge, Reflecting, Red. " Oil Cup. Globe Valves, Brass, Clean Seat. " Valves, Brass, Jenkins Bros. " Valves, Brass, Jenkins Bros. " Valves, Brass, Needle Point. " Valves, Brass, Standard. " Valves, Iron Body, Extra Heavy. " Valves, Iron Body, Jenkins Bros. " Valves, Iron Body, Lunkenheimer. " Valves, Iron Body, Standard. Globes, Lantern. |
| Glue Heaters |
| Glue Heaters |
| Glue Heaters " Warmers Gold Medal Land and Lawn Rollers |
| Glue Heaters " Warmers Gold Medal Land and Lawn Rollers |
| Glue Heaters " Warmers Gold Medal Land and Lawn Rollers |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers Golden's Cane Mills. "Evaporators. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers Golden's Cane Mills. "Evaporators. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Gordon Hollow Blast Grates. |
| Glue Heaters " Warmers Gold Medal Land and Lawn Rollers Golden's Cane Mills " Evaporators Gong Whistles, Iron Good Year Patent Load Binders Goose Neck Screws Gordon Hollow Blast Grates " Hollow Blast Smoke Stacks |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. |
| Glue Heaters. "Warmers. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson." "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Misson. |
| Glue Heaters "Warmers "Warmers Gold Medal Land and Lawn Rollers Evaporators Gong Whistles, Iron Good Year Patent Load Binders Goose Neck Serews Gordon Hollow Blast Grates Hollow Blast Smoke Stacks Governors, Gardner Judson "Pickering Pump, Carr Pump, Fisher Pump, Gardner "Pump, Gardner "Pump, Mason |
| Glue Heaters "Warmers "Warmers Gold Medal Land and Lawn Rollers Evaporators Gong Whistles, Iron Good Year Patent Load Binders Goose Neck Serews Gordon Hollow Blast Grates Hollow Blast Smoke Stacks Governors, Gardner Judson "Pickering Pump, Carr Pump, Fisher Pump, Gardner "Pump, Gardner "Pump, Mason |
| Glue Heaters "Warmers "Warmers Gold Medal Land and Lawn Rollers Evaporators Gong Whistles, Iron Good Year Patent Load Binders Goose Neck Serews Gordon Hollow Blast Grates Hollow Blast Smoke Stacks Governors, Gardner Judson "Pickering Pump, Carr Pump, Fisher Pump, Gardner "Pump, Gardner "Pump, Mason |
| Glue Heaters "Warmers "Warmers Gold Medal Land and Lawn Rollers Evaporators Gong Whistles, Iron Good Year Patent Load Binders Goose Neck Serews Gordon Hollow Blast Grates Hollow Blast Smoke Stacks Governors, Gardner Judson "Pickering Pump, Carr Pump, Fisher Pump, Gardner "Pump, Gardner "Pump, Mason |
| Glue Heaters "Warmers Gold Medal Land and Lawn Rollers Gold Medal Land and Lawn Rollers Golden's Cane Mills Evaporators Gong Whistles, Iron Good Year Patent Load Binders Goose Neck Serews Gordon Hollow Blast Grates "Hollow Blast Smoke Stacks Governors, Gardner "Judson "Pickering "Pump, Carr "Pump, Fisher "Pump, Fisher "Pump, Mason "Pump, Mason "Pump, Waters " |
| Glue Heaters. " Warmers. Gold Medal Land and Lawn Rollers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. " Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. " Judson. " Pickering. " Pump, Carr. " Pump, Fisher. " Pump, Gardner. " Pump, Gardner. " Pump, Mason. " Pump, S-C. " Pump, Waters. " Pump, Waters. " Pump, Waters. " Pump, Watson. Gra Knight Leather Belting. Grab Chain Hooks. |
| Glue Heaters "Warmers Gold Medal Land and Lawn Rollers Golden's Cane Mills Evaporators Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates "Hollow Blast Smoke Stacks. Governors, Gardner "Judson "Pickering "Pump, Carr. "Pump, Gardner "Pump, Gardner "Pump, Gardner "Pump, Mason "Pump, Mason "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Hooks Gradine Hooks Gradine Plows |
| Glue Heaters "Warmers Gold Medal Land and Lawn Rollers Golden's Cane Mills Evaporators Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates "Hollow Blast Smoke Stacks. Governors, Gardner "Judson "Pickering "Pump, Carr. "Pump, Gardner "Pump, Gardner "Pump, Gardner "Pump, Mason "Pump, Mason "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Waters "Pump, Hooks Gradine Hooks Gradine Plows |
| Glue Heaters. "Warmers. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson. "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, S-C. "Pump, Waters. "Pump, Wat |
| Glue Heaters. " Warmers. Gold Medal Land and Lawn Rollers. Gold Medal Land and Lawn Rollers. Gold Medal Land and Lawn Rollers. Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Screws. Gordon Hollow Blast Grates. Hollow Blast Smoke Stacks. Governors, Gardner Judson. " Pickering. Pickering. Pump, Carr. Pump, Fisher. Pump, Fisher. Pump, Mason. Pump, S-C. Pump, Waters. " Cra Knight Leather Belting. Grab Chain Hooks. Grading Plows. Graphite Brass Lubricating. Graphite Brass Lubricators. " Greese |
| Glue Heaters. "Warmers. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Screws. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson." "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, Mason. "Pump, S-C. "Pump, Waters. "Grab Chain Hooks. "Graphite. Lubricating. "Graphite. Lubricating. "Graphite Brass Lubricators. "Grease. "Pipe Joint Compound. |
| Glue Heaters. " Warmers. Gold Medal Land and Lawn Rollers. Gold Medal Land and Lawn Rollers. Gold Medal Land and Lawn Rollers. Gong Whistles, Iron. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Screws. Gordon Hollow Blast Grates. Hollow Blast Grates. Bulson. " Pickering. Pickering. Pump, Carr. " Pump, Fisher. " Pump, Gardner. Pump, Misson. Pump, S-C. Pump, Waters. " Gra Knight Leather Belting. Grab Chain Hooks Grading Plows. Graphite Lubricating Graphite Brass Lubricators. " Grase. " Pipe Joint Compound. " Sheet Lubricator Randall. |
| Glue Heaters. " Warmers. Gold Medal Land and Lawn Rollers. Gold Medal Land and Lawn Rollers. Gold Medal Land and Lawn Rollers. Gong Whistles, Iron. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Screws. Gordon Hollow Blast Grates. Hollow Blast Grates. Bulson. " Pickering. Pickering. Pump, Carr. " Pump, Fisher. " Pump, Gardner. Pump, Misson. Pump, S-C. Pump, Waters. " Gra Knight Leather Belting. Grab Chain Hooks Grading Plows. Graphite Lubricating Graphite Brass Lubricators. " Grase. " Pipe Joint Compound. " Sheet Lubricator Randall. |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Goose Neck Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors. Gardner. "Dickering. "Pickering. "Pump. Carr. "Pump. Fisher. "Pump. Gardner. "Pump. Gardner. "Pump. S-C. "Pump. Waters. "Pump. Waters. "Pump. Waters. "Pump. Waters. "Pump. Waters. "Pump. Waters. "Pump. Grad Crab Chain Hooks Grading Plows Graphite. Lubricating Graphite Brass Lubricators. "Grease. "Pipe Joint Compound "Sheet Lubricator, Randall. Grapple Hooks Grapple Hooks, Timber |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neek Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson. "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, Gardner. "Pump, SeC. "Pump, Waters. "Pump, Waters. "Pump, Waters. "Pump, Waters. "Pump, Waters. "Pump, Blast Grab Chain Hooks. Grab Chain Hooks. Graphite Lubricating. Graphite Brass Lubricators. "Grease. "Pip Joint Compound. "Sheet Lubricator, Randall. Grapples, Timber. |
| Glue Heaters. "Warmers "Warmers Gold Medal Land and Lawn Rollers Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson. "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, Gardner. "Pump, S-C. "Pump, Waters. "Pump, Waters |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates. Hollow Blast Smoke Stacks. Governors, Gardner Judson. "Pickering. Pump, Carr. "Pump, Fisher. Pump, Gardner. "Pump, Fisher. Pump, Mason. "Pump, S-C. "Pump, Waters. "Pump, Blast Lubricating. Grab Chain Hooks. Grading Plows Graphite Lubricating. Graphite Brass Lubricators. "Grease" "Pipe Joint Compound Sheet Lubricator, Randall. Grapple Hooks Grapples, Timber Grate Bars. Grates. Gordon Hollow Blast. "Gutter |
| Glue Heaters. "Warmers. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson." "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, Mason. "Pump, S-C. "Pump, Waters. "Pump, Water |
| Glue Heaters. "Warmers. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson." "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, Mason. "Pump, S-C. "Pump, Waters. "Pump, Water |
| Glue Heaters. "Warmers. "Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. "Evaporators. Gong Whistles, Iron. Good Year Patent Load Binders. Goose Neck Serews. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner. "Judson." "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, Mason. "Pump, S-C. "Pump, Waters. "Pump, Water |
| Glue Heaters. "Warmers. Gold Medal Land and Lawn Rollers. Good Sear Patent Load Binders. Goose Neck Screws. Gordon Hollow Blast Grates. "Hollow Blast Smoke Stacks. Governors, Gardner "Judson. "Pickering. "Pickering. "Pump, Carr. "Pump, Fisher. "Pump, Gardner. "Pump, Fisher. "Pump, Mason. "Pump, S-C. "Pump, Waters. "Grab Chain Hooks. Grading Plows. Grabit Lubricating. Graphite Brass Lubricators. "Grease. "Pipe Joint Compound. "Sheet Lubricator, Randall. Grapples, Timber Grate Bars. Grates. Gordon Hollow Blast. "Gutter. "Gutter. "Gravity Batteries. Grease, Albany. "Cup. |
| Glue Heaters. " Warmers. " Warmers. Gold Medal Land and Lawn Rollers. Golden's Cane Mills. " Evaporators. Gong Whistles, Iron. Goog Year Patent Load Binders. Goose Neck Screws. Gordon Hollow Blast Grates. " Hollow Blast Smoke Stacks. Governors, Gardner. " Judson. " Pickering. " Pump, Carr. " Pump, Fisher. " Pump, Gardner. " Pump, Gardner. " Pump, Sardner. " Pump, Waters. " Pump, Waters. " Pump, Waters. " Pump, Waters. " Pump Waters. " Pump Waters. " Pump Waters. " Pump Blast Grabe Grabe Grabers. " Graber Chain Hooks. Graphite Lubricating. Graphite Brass Lubricators. " Grease. " Pipe Joint Compound. " Sheet Lubricator, Randall. Grapple Hooks. Grapples, Timber Grate Bars. Grates. Gordon Hollow Blast. " Gutter. Gravity Batteries. |

| Page | |
|---|----|
| Page Page Cups, Brass. 186 Cups, Steel. 186 Cups, Steel. 186 Grinders, Cutter and Tool, Dayton Universal 919 Drill, Yankee 920, 921 Edging, Chattanooga 1088 Emery Wheel 916-918, 1062, 1063 Knife, Buffalo Improved 1062 Knife, Buffalo Improved 1063 Water Tool 918 Water Tool 918 Water Tool, Bench 916 Grinding Holders 829 Machines 1062 Mills 1125, 1126 Grindstone Fixtures 678 Frames 677 | H |
| " Cups, Steel | E |
| "Drill Yankee 920 921 | H |
| " Edging, Chattanooga1088 | - |
| " Emery Wheel | |
| Knife, Buffalo Improved | |
| " Water Tool 918 | |
| " Water Tool, Bench 916 | |
| Grinding Holders 829 | |
| " Machines | |
| Grindstone Fixtures | |
| " Frames 677 | |
| Grindstones | |
| Grit-Proof Chain Tiggs 372 | Н |
| Grindstone Fixtures 678 "Frames 677 Grindstones 677, 678 Grocers' Scales 496 Grit-Proof Chain, Tisco 372 Groove and Tongue Machines 1110 Groovers, Belt 35 Grooving Saws, Simonds 1030 Grub Hees 503 | • |
| Groovers, Belt | |
| Grooving Saws, Simonds | H |
| Guides Saw Atkins 1050 | L |
| Guides and Rounders, Saw, Combined1050 | |
| Grooving Saws, Simonds 1030 | |
| Gummers, Saw, Disston | |
| Gummers and Sharpeners, Saw. Atkins1053 | |
| Guns, Phosphate | |
| Gutter Grates | |
| Guy Dorricks 466 | |
| H | |
| HACK Saw Blades | |
| " Saw Frames | н |
| " Saws Power 533 | Ĥ |
| Haines Improved Steam Traps 166 | Ħ |
| Hair Felt | H |
| Hall's Pine Wrenches 788 | H |
| Hame Rivets | Î |
| Hammer Handles | £ |
| Hammers, Beading, Pneumatic 500 | H |
| " Boilermakers' | H |
| " Bridge Builders' 509 | H |
| " Calking, Pneumatic | |
| " Copper Solid 500 | Н |
| " Engineers' 508 | Î |
| " Hand, Blacksmiths' 510 | |
| " Machinists' | |
| " Riveting 509 | |
| " Riveting, Pneumatic 500 | H |
| " Rounding | |
| " Set Ricksmiths' 542 | н |
| " Ship Builders' | Ĥ |
| " Steam, Bell Improved | |
| " Swaging | |
| Hancock Inspirators | H |
| Hand Blowers, Buffalo | H |
| " Cars | |
| " Force Pumps 093 084 | H |
| " Hack Saws | 4. |
| " Hammers, Blacksmiths' | _ |
| Lamps, Malleable Iron | H |
| " Milling Tools, Vixen 663 | Ë |
| " Pipe Machines, Armstrong 806, 807 | H |
| " Pipe Machines, Forbes Patent 808 | H |
| rullers, Steam Gauge | |
| " Punches, Round | |
| Guy Caps. 470 Guy Derricks. 406 HACK Saw Blades 535 "Saw Frames 534 "Saws, Hand 534 "Saws, Hand 534 "Saws, Power 533 Haires Improved Steam Traps 166 Hair Felt 18 Half and Half Solder 514 Hall's Pipe Wrenches 788 Hame Rivets 644 Hammer Handles 511 Hammers, Beading, Pneumatic 500 "Blacksmiths" 509 "Boilermakers" 509 "Bridge Builders" 509 "Bridge Builders" 509 "Calking, Pneumatic 500 "Chipping, Pneumatic 500 "Rounding, Found 509 "Bridge Builders" 509 "Bridge Builders" 509 "Bridge Builders" 509 "Bridge Builders" 509 "Rounding, 509 "Rounding, 509 "Rounding, 509 "Sawmakers' 1047, 1048 "Set, Blacksmiths' 542 "Ship Builders' 509 "Steam, Bell Improved 880 "Swaging, 1048 Hanchett Saw Swages 1043, 1044 Hancock Inspirators. 183 Hand Blowers, Buffalo 555 "Cars. 536 "Cylinder Oil Pumps. 201 "Force Pumps. 993, 984 "Hack Saws. 534 Hammers, Blacksmiths' 510 Lamps, Malleable Iron 209 "Metal Punches, Whitney 549 "Milling Tools, Vixen 663 "Pipe Machines, Forbes Patent 808 "Pulers, Steam Gauge 104 "Punches, Portable 549 "Punches, Portable 549 "Punches, Portable 549 "Shager Portable 549 "Shager Portable 549 "Shager Portable 549 | |
| " Screws | |

| | P | ag |
|--|-----------------------------|--|
| Hand Tallies " Taps, Machinists' Handle Forgings, Machine | : | 14 |
| " Taps, Machinists' | 757, | 75 |
| Handle Forgings, Machine | } | 53 51 |
| | | 51 |
| " Axe Broad Axe | | 51 |
| " Cant Hook | | 56 66 |
| File | ٠ إ | 66 |
| " Hammer | • • • • | 51 51 |
| Maul | | 51 51 |
| Peavev | | 56 51 |
| | } | 51 |
| Pick Post Maul. Saw, Cross-Cut, Disston. Sledge Tool. Handy Lever Gate Valves, Brass Lever Gate Valves, Iron Body. Tap Wrenches. | • • • • • • | 51 |
| " Sladge | 1 | υ 51 |
| " Tool | 1 | 51 |
| Handy Lever Gate Valves, Brass | | . 7 |
| " Lever Gate Valves, Iron Body | | .8 |
| Un non- Some | • • • • | /8 20 |
| Hanger Screws | iii l | 02 41 |
| Lever Gate Valves, Iron Body Tap Wrenches. Hanger Screws Hangers, Ball and Socket, Dodge Drop Head, Dodge Pipe, Ball Joint, Hanna Pipe, Expansion Ring Pipe, Extension Pipe, Fand M Pipe, Solid Ring Pipe, Split Ring Pipe, Steel Band Pipe, Swivel Base Post, Ball and Socket, Dodge Post, Bond Shafting, Bond Shafting, Dodge Hangers for Spiral Conveyors. | | ā i |
| " Pipe, Ball Joint, Hanna | : | 31 |
| " Pipe, Expansion Ring | | 31 |
| " Pipe, Extension | • • • • | 31 |
| " Pine Solid Ring | • • • • | 3 i |
| " Pipe, Split Ring | | 3ĩ |
| " Pipe, Steel Band | : | 31 |
| " Pipe, Swivel Base | | 31 |
| " Post, Ball and Socket, Dodge | • • • • • | # I |
| " Shafting, Bond | 419- | 42 |
| " Shafting, Dodge | 414- | 41 |
| Hangers for Spiral Conveyors | } | 35 |
| Hanna Ball Joint Pipe Hangers | | 31 |
| Hargrave Washer Cutters | • • • • | 3 |
| Hangers for Spiral Conveyors Hanna Ball Joint Pipe Hangers Hardies, Blacksmiths' Hargrave Washer Cutters Hart's Adjustable Bolt Stocks and Dies. | | 78 |
| Hatchet Handles | | 51 |
| Haul-Ups, Log, Friction | 19 | 08 |
| Haulage Rope | | 38 |
| Hayden Brass Pine Wrenches | • • • • | 78 |
| Head Blocks, Saw Mill | 10 | 06 |
| Heading Bands | (| 64 |
| " Saws, Simonds | 19 | 02 |
| ·· I 0019 | | 04 |
| Unadlighta | ; | 91 |
| Headlights | | 21 17 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion | | 21 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman | | 21 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout | | 21 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power | | 21 17 17 17 17 98 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout "Working, Power Hearts and Leaves "and Spoons | | 21 17 17 17 17 98 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion Exhaust Pipe, Lyman. Exhaust Pipe, Swartwout Working, Power. Hearts and Leaves and Spoons and Squares. | | 21 17 17 17 17 57 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Squares Heat Proof Covering | | 21 17 17 17 17 17 17 57 57 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout "Working, Power Hearts and Leaves "and Spoons "and Squares Heat Proof Covering Heaters, Feed Water, Cochrane | | 21 17 17 17 17 17 57 57 57 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout Working, Power Hearts and Leaves "and Spoons and Squares Heat Proof Covering Heaters, Feed Water, Cochrane "Glue "Water, Feed Frie City | | 21 17 17 17 17 17 17 57 57 17 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion Exhaust Pipe, Lyman. Exhaust Pipe, Swartwout Working, Power. Hearts and Leaves. and Spoons and Squares. Heat Proof Covering. Heaters, Feed Water, Cochrane. "Glue. "Water, Feed, Erie City. "Water, Feed, Hoppes | 675, (170, 172 | 21 17 17 17 17 17 57 57 17 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout "Working, Power Hearts and Leaves "and Spoons "and Squares Heat Proof Covering Heaters, Feed Water, Cochrane "Glue "Water, Feed, Erie City "water, Feed, Hoppes Heating Boilers, Ideal | 20, 675, (170, 172, | 21 17 17 17 17 17 17 57 57 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Squares Heat Proof Covering Heaters, Feed Water, Cochrane Glue Water, Feed, Hoppes Heating Boilers, Ideal Hecla Air Pump Packing | | 21 17 17 17 17 17 57 57 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout Working, Power Hearts and Leaves "and Spoons and Squares Heat Proof Covering Heaters, Feed Water, Cochrane "Glue "Water, Feed, Erie City "Water, Feed, Hoppes Heating Boilers, Ideal Hecla Air Pump Packing "Covering "Covering | | 21 17 17 17 17 17 17 17 17 17 17 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Spoons and Squares Heat Proof Covering, Heaters, Feed Water, Cochrane Glue Water, Feed, Erie City Water, Feed, Hoppes, Heating Boilers, Ideal Hecla Air Pump Packing Covering, Height Gauge Attachments Helicoid Improved Spring Packing | 675, (170, 172, | 21 17 17 17 17 17 17 17 17 17 17 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Squares Heat Proof Covering. Heaters, Feed Water, Cochrane Glue Water, Feed, Hoppes. Heating Boilers, Ideal Hecla Air Pump Packing Covering. Height Gauge Attachments Helicoid Improved Spiral Packing. Red Core Ring Packing | 675, (170, 172, | 21 17 17 17 17 17 17 17 17 17 17 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout "Working, Power Hearts and Leaves "and Spoons "and Squares Heat Proof Covering Heaters, Feed Water, Cochrane "Glue "Water, Feed, Hoppes Heating Boilers, Ideal Hecla Air Pump Packing "Covering Height Gauge Attachments Helicoid Improved Spiral Packing "Red Core Ring Packing "Red Core Ring Packing "Red Core Spiral Packing "Red Core Spiral Packing | | 217171717171717171717171717171717171717 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Spoons and Squares Heat Proof Covering Heaters, Feed Water, Cochrane Glue Water, Feed, Erie City Water, Feed, Hoppes Heating Boilers, Ideal Heela Air Pump Packing Covering Height Gauge Attachments Helicoid Improved Spiral Packing Red Core Ring Packing Red Core Spiral Packing Red Core Spiral Packing Hemp Packing | | 21 17 17 17 17 17 17 17 17 17 17 17 17 17 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Squares Heat Proof Covering Heaters, Feed Water, Cochrane Glue Water, Feed, Erie City Water, Feed, Hoppes Heating Boilers, Ideal Hecla Air Pump Packing Covering Height Gauge Attachments Helicoid Improved Spiral Packing Red Core Ring Packing Red Core Spiral Packing Red Core Spiral Packing Red Core Spiral Packing Red Core Spiral Packing Hemp Packing Hemp Packing Hemp Packing Hemp Packing Hemp Packing | | 2177177177177177177177177177177177177177 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout "Working, Power Hearts and Leaves "and Spoons "and Squares Heat Proof Covering Heaters, Feed Water, Cochrane "Glue "Water, Feed, Erie City "Water, Feed, Hoppes Heating Boilers, Ideal Hecla Air Pump Packing "Covering Height Gauge Attachments Helicoid Improved Spiral Packing "Red Core Ring Packing "Red Core Spiral Packing "Red Core Spiral Packing Hemp Packing Henderer Pipe Vises Hermaphrodite Calipers Hersgen Red Coulbings | 20, 675, 1170, 20, | 217171717171717171717171717171717171717 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout "Working, Power Hearts and Leaves "and Spoons "and Squares Heat Proof Covering Heaters, Feed Water, Cochrane "Glue "Water, Feed, Erie City "Water, Feed, Hoppes Heating Boilers, Ideal Hecla Air Pump Packing "Covering Height Gauge Attachments Helicoid Improved Spiral Packing "Red Core Ring Packing "Red Core Spiral Packing "Red Core Spiral Packing Hemp Packing Hemp Packing Hemp Packing Hemp Packing Hermaphrodite Calipers Hexagon Rod Couplings High Brass Rods | | 2177177177177177177177177177177177177177 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Squares Heat Proof Covering Heaters, Feed Water, Cochrane Glue Water, Feed, Erie City Water, Feed, Hoppes Heating Boilers, Ideal Hecla Air Pump Packing Covering Height Gauge Attachments Helicoid Improved Spiral Packing Red Core Ring Packing Red Core Spiral Packing Hemp Packing Hemp Packing Hemp Packing Hempahrodite Calipers Hexagon Rod Couplings High Brass Rods "Duty Steel Balls | 20, | 2177177177177177177177177177177177177177 |
| Headlights Heads, Exhaust Pipe, Burt. Exhaust Pipe, Champion Exhaust Pipe, Lyman Exhaust Pipe, Lyman Exhaust Pipe, Swartwout Working, Power Hearts and Leaves and Spoons and Squares Heat Proof Covering, Heaters, Feed Water, Cochrane Water, Feed, Hoppes, Heaters, Feed, Erie City Water, Feed, Hoppes, Heating Boilers, Ideal Hecla Air Pump Packing Covering, Height Gauge Attachments, Helicoid Improved Spiral Packing, Red Core Ring Packing, Red Core Spiral Packing, Hemp Packing, Hemp Packing, Hemderer Pipe Vises, Hermaphrodite Calipers, Hexagon Rod Couplings, High Brass Rods, Duty Steel Balls, Pressure Coil Packing, Diagonal Exp | | 2177177177177177177177177177177177177177 |
| Headlights Heads, Exhaust Pipe, Burt. "Exhaust Pipe, Champion "Exhaust Pipe, Lyman "Exhaust Pipe, Swartwout "Working, Power Hearts and Leaves "and Spoons "and Squares Heat Proof Covering Heaters, Feed Water, Cochrane "Glue "Water, Feed, Erie City "Water, Feed, Hoppes Heating Boilers, Ideal Heela Air Pump Packing "Covering Height Gauge Attachments Helicoid Improved Spiral Packing "Red Core Spiral Packing "Red Core Spiral Packing Hemperer Pipe Vises Hermaphrodite Calipers Hexagon Rod Couplings High Brass Rods "Duty Steel Balls "Pressure Coil Packing, Semibrorse | | 2177177177177177177177177177177177177177 |
| "Shafting, Bond. "Shafting, Dodge. Hangers for Spiral Conveyors. Hanna Ball Joint Pipe Hangers. Hardies, Blacksmiths' Hargrave Washer Cutters. Hards Adjustable Bolt Stocks and Dies. Hatchet Handles. Haul-Ups, Log, Friction. Haulage Rope Hay-Budden Anvils. Hayden Brass Pipe Wrenches. Head Blocks, Saw Mill. Heading Bands. "Saws, Simonds. "Tools. Heading Bands. "Exhaust Pipe, Burt. "Exhaust Pipe, Burt. "Exhaust Pipe, Lyman. Exhaust Pipe, Lyman. "Exhaust Pipe, Lyman. "Exhaust Pipe, Swartwout. "Working, Power. Hearts and Leaves. "and Spoons. Heat Proof Covering. Heaters, Feed Water, Cochrane. "Glue. "Water, Feed, Hoppes. Heating Boilers, Ideal. Hecla Air Pump Packing. "Covering. Height Gauge Attachments. Helicoid Improved Spiral Packing. "Red Core Spiral Packing. "Red Core Spiral Packing. Hemp Packing. Hemp Packing. Hemp Packing. Hemp Packing. Henderer Pipe Vises. Hermsphrodite Calipers. Hexagon Rod Couplings. High Brass Rods. "Duty Steel Balls. "Pressure Coil Packing, Semibronze. "Pressure Coil Packing, Dixie." | | 217717717717717717717717717771777177717 |



| High | Speed Twist Drills. Nails. S, Gate, Self Closing. Swing Saw. Grub. | | 710 |
|--|---|-----------------------------------|--|
| Hines | Noile | | 630 |
| Uinge | Cata Salf Closing | | 957 |
| Time | es, Gave, sen Closing | • • • • | 1077 |
| ** | Swing Saw Grub Grub Chattanooga. ing Engines, Lidgerwood Rope, Extra Pliable Rope, Plough Steel Rope, Standard Winches s, Air, Curtis Belt, Lidgerwood Chain, Differential Chain, Screw-Geared, Duplex Chain, Spur-Geared, Triplex Electric, Lidgerwood res, Drill, Armstrong Grinding Razor Hone Reamer, Armstrong | • • • • | 1077 |
| Hoes, | Grub | · · · · | 903 |
| Hogs, | Chattanooga | | 1088 |
| Hoist | ing Engines, Lidgerwood | .455 | -458 |
| ** | Rope, Extra Pliable | | 385 |
| 4 | Rope, Plough Steel | .383 | . 384 |
| ** | Rone Standard | 382 | 383 |
| ** | Winches | 461 | 462 |
| TT . 1 . 4 | A'- C | .401 | 700 |
| HOIST | s, Air, Curtis | | 404 |
| | Belt, Lidgerwood | | 4.09 |
| ••• | Chain, Differential | | 450 |
| ** | Chain, Screw-Geared, Duplex | | 450 |
| ** | Chain, Spur-Geared, Triplex | | 451 |
| ** | Electric Lidgerwood | | 460 |
| Halde | na Drill Armstrong | . | 800 |
| Holue | O-!- 1:- | | 900 |
| | Grinding | • • • • | 829 |
| ••• | Razor Hone | | 608 |
| •• | Reamer, Armstrong | | 828 |
| ** | Reamer, Armstrong | .824 | -829 |
| Hollo | w Mills | | 753 613 |
| | Set Screws | | 613 |
| ** | Twist Drills | | 709 |
| U | Doson Conhomedum | | 669 |
| Tione | S, Assor, Carborundum | | 005 |
| Hook | riates, Cast Iron | · · · · | 309 |
| •• | Plates, Expansion | . | 308 |
| ** | Plates, Steel | | 309 |
| •• | Tool, Armstrong. w Mills. Set Screws Twist Drills. s, Rasor, Carborundum Plates, Cast Iron Plates, Expansion Plates, Steel. Rules, Steel and Handle Rules, Blacksmiths' aroons s, Beam Belt. | | 836 |
| ** | and Handle Rules, Blacksmiths' | | 836 |
| Hook | aroons | | 561 |
| Hank | Doam | | 309 |
| HOOK | 8, Deam | | . our |
| | Belt | 3 | 1, 33 |
| | Cant | . 559 | , 560 |
| ** | Chain | | - 5 64 |
| ** | Grapple | | 563 |
| " | Lug | | 562 |
| ** | LugPeaveyPipe, Gas | · · · · | 560 |
| | Dia Can | | 310 |
| | | | |
| | | | |
| ** | Staple | | 310 |
| | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Chack Values Reses Jenkins | . 172 | 310 563 390 390 1009 2, 173 |
| | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Chack Values Reses Jenkins | . 172 | 310 563 390 390 1009 2, 173 |
| | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Chack Values Reses Jenkins | . 172 | 310 563 390 390 1009 2, 173 |
| Hook Hoop Hopp Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Chack Values Reses Jenkins | . 172 | 310 563 390 390 1009 2, 173 |
| Hook Hoop Hopp Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Chack Values Reses Jenkins | . 172 | 310 563 390 390 1009 2, 173 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Other Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. | 310 563 390 390 1009 2, 173 68 71 66 81 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker | .172 Bros. ros. | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters ontal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard Power of Belts Power of Belts Power Rules Shoe Dollies Rasps shoers' Tongs Shoers' Tongs Shoers' Tongs | 172 Bros. ros. nhei- | 310 563 390 390 1009 1, 173 68 71 68 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters ontal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard Power of Belts Power of Belts Power Rules Shoe Dollies Rasps shoers' Tongs Shoers' Tongs Shoers' Tongs | 172 Bros. ros. nhei- | 310 563 391 1009 1173 68 71 1137 1138 1143 567 659 48 |
| Hook Hoop Hop Horis " " " Horse Horse Horse | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters ontal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard Power of Belts Power of Belts Power Rules Shoe Dollies Rasps shoers' Tongs Shoers' Tongs Shoers' Tongs | 172 Bros. ros. nhei- | 310 563 391 1009 1, 173 68 71 68 81 1137 1138 1143 567 548 785 548 554 |
| Hook Hoop Hopp Horis | Stapie Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters ontal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard Power of Belts Power of Belts Power Rules Shoe Dollies Rasps shoers' Tongs Shoers' Tongs Shoers' Tongs | 172 Bros. ros. nhei- | 310 563 391 1009 1, 173 68 71 68 81 1137 1138 1143 567 548 785 548 554 |
| Hook Hoop Hop Horis " " " Horse Horse Horse | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent es Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Standard Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Belts Power of Bulleys Power Rules Shoe Dollies Rasps Shoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift | . 172 Bros. ros. . nhei- | 310 563 390 390 10099; 173 68 81 1137 1138 1143 567 544 785 488 51 |
| Hook Hooris | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent es Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Standard Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Belts Power of Bulleys Power Rules Shoe Dollies Rasps Shoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift | . 172 Bros. ros. . nhei- | 310 563 390 390 390 390 68 71 66 81 1137 1138 1143 48 51 48 51 48 |
| Hook Hoop Hop: Horse Horse Horse Hose, | Staple Swamp s and Sockets, Wire Rope and Thinbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunken mer Check Valves, Iron Body, Standard Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps Shoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender | . 172 Bros. ros. nhei- | 310 563 390 390 1009 1173 68 71 66 81 1137 1138 567 48 51 50 48 |
| Hook Hoop Hop Horis "" "Horse Horse Horse | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard 2 Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps Seshoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Carden | . 172 Bros. ros. nhei- | 310 563 390 10099 11009 1173 68 71 68 81 1138 567 547 45 45 45 45 |
| Hook Hoop Hop Horis Horse Horse Hose Hose Hose | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard 2 Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps Seshoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Carden | . 172 Bros. ros. nhei- | 310 563 390 10099 1173 68 71 68 81 79 1137 1138 1143 1567 48 48 48 48 |
| Hook Hoop Hopp Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard 2 Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps Seshoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Carden | . 172 Bros. ros. nhei- | 310 563 390 1009 2, 173 68 71 68 71 137 1138 1143 567 48 51 51 50 48 48 45 48 |
| Hook Hoop Hopp Horis Horse Horse Horse Horse | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard 2 Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps Seshoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Carden | . 172 Bros. ros. nhei- | 310 563 390 10099 173 68 71 66 81 1137 1138 1143 785 544 45 45 45 48 |
| Hook Hoop Hop Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Lunker mer Check Valves, Iron Body, Standard 2 Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps Seshoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Carden | . 172 Bros. ros. nhei- | 310 563 390 1009 2, 173 68 71 68 71 137 1138 1143 567 48 51 51 50 48 48 45 48 |
| Hook Hoop Hopp Horis Horse Horse Horse Horse | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent es Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Belts Power of Belts Power of Dulleys Power of Belts Shoe Dollies Rasps eshoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate | . 172 Bros. ros. nhei- | 310 563 390 10099 173 66 81 1137 1138 1143 1567 659 48 48 51 48 51 48 |
| Hook Hoop Hop Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Standard Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Belts Shoe Dollies Rasps Sshoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic | . 172 Bros. ros. nhei- | 310 563 390 1009 1173 68 81 1137 1137 1143 567 48 51 48 45 48 45 48 45 48 45 48 |
| Hook Hoop Hopp Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters ontal Check Valves, Brass, Jenkins I Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Pulleys Power of Pulleys Power of Pulleys Power Tongs Schoe Dollies Rasps Schoers' Tongs Gried Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam | . 172 Bros. ros. nhei- | 310 563 399 31009 31009 31009 3110 668 81 1137 1138 45 45 45 45 45 45 45 45 45 45 45 45 45 |
| Hooke | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters Ontal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Pulleys Power of Pulleys Power Rules Shoe Dollies Rasps Siboers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drift Drift Drift Drift, Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel | . 172 Bros. ros. nhei- | 31(656;39) 390;10090;177;66;81 1166;81 1137;1138;1143;567;6544;785;48;50;455;445;48;50;455;445;48;50;455;48;50;455;48;50;455;48;48;48;48;48;48;48;48;48;48;48;48;48; |
| Hoop Hopp Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard check Valves, Iron Body, Standard Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps schoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel Suction | . 172 Bros. ros. nhei- | 310 563 399 10099 1768 671 681 813 771 1138 811 1137 567 481 451 451 451 451 451 |
| Hoope Horse | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard check Valves, Iron Body, Standard Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps schoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel Suction | . 172 Bros. ros. nhei- | 310 56; 399 10099; 17; 68 81 1143; 6659 47 48 50 45; 47 48 51 48 51 48 51 48 51 48 51 48 51 51 48 51 51 51 51 51 51 51 51 51 51 51 51 51 |
| Hoop Hopp Horis | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard check Valves, Iron Body, Standard Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps schoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel Suction | . 172 Bros. ros. nhei- | 310 563 399 10099; 173 681 71 138 1138 1138 1138 1138 1138 1138 |
| Hoop Hop Hop Hop Hop Hop Hop Hop Hop Hop | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ses Feed Water Heaters contal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard check Valves, Iron Body, Standard Power of Belts Power of Pulleys Power Rules Shoe Dollies Rasps schoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel Suction | . 172 Bros. ros. nhei- | 310 563 399 10099; 173 681 71 138 1138 1138 1138 1138 1138 1138 |
| Hoope Horse | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent es Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Belts Power of Pulleys Power of Pulleys Power Tongs Shoe Dollies Rasps Shoe Dollies Rasps Shoers' Tongs Field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel Suction Water Wire Winding of Bibb Ends | . 172 Bros. ros. nhei- | 310 563 399 10099; 173 681 71 138 1138 1138 1138 1138 1138 1138 |
| Hoop Hop Hop Hop Hop Hop Hop Hop Hop Hop | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent ees Feed Water Heaters ontal Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Pulleys Power fulles Shoe Dollies Rasps Shoe Dollies Rasps Sehoers' Tongs field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel Suction Water Wire Winding of Bibb Ends Bushings | . 172 Bros. ros. nhei- | 3105563 390339064 10736 71688 711383 15679 11383 15679 15845 1594 |
| Hoop Hopp Hops Horse Horse Hose Hose Hose Hose Hose Hose Hose Ho | Staple Swamp s and Sockets, Wire Rope and Thimbles, Wire Rope Lugs, Tecktonius' Patent es Feed Water Heaters Check Valves, Brass, Jenkins I Check Valves, Brass, Lunkenheimer Check Valves, Brass, Standard Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Jenkins B Check Valves, Iron Body, Standard Power of Belts Power of Belts Power of Belts Power of Pulleys Power of Pulleys Power Tongs Shoe Dollies Rasps Shoe Dollies Rasps Shoers' Tongs Field Tap and Reamer Wrenches Air Brake Copper Drift Drill, Air Engine and Tender Garden Linen Metal Mill, Cotton Phosphate Pneumatic Steam Steel Suction Water Wire Winding of Bibb Ends | . 172 Bros. ros. nhei- | 310 563 399 10099; 173 681 71 138 1138 1138 1138 1138 1138 1138 |

| Hose Couplings. |
|---|
| Fittings |
| " Gate Valves, Brass |
| " Mender Clamps |
| Hose Couplings. Fittings Gate Valves, Brass. Mender Clamps Mipples Pipes Racks, Swinging Reducers Reels Reels, Swinging. |
| " Nipples |
| " Pipes |
| Racks, Swinging |
| " Deale |
| " Reels. " Reels, Swinging. " Spanners. |
| Reels, Swinging. Spanners. Sprinklers. Strainers. Strap Fasteners. Valves, Brass. Washers, Rubber. |
| " Sprinklers |
| " Strainers |
| " Stran Fasteners |
| " Straps |
| " Valves, Brass |
| " Washers, Rubber |
| Hot Pressed Nuts |
| " Water Spiral Packing, Carolina |
| House Force Pumps |
| " Lift Pumps |
| Hub Lifters, Moulders' |
| Tools, Moulders' |
| Humphrey's Combined Drills, Reamers as |
| Taps |
| nuntington Emery wheel Dressers |
| Track Gauges |
| Hydropta Consent |
| "Valves, Brass. "Washers, Rubber. Hot Pressed Nuts. "Water Spiral Packing, Carolina. House Force Pumps. "Lift Pumps. Hub Lifters, Moulders'. "Tools, Moulders'. "Tools, Moulders'. Humphrey's Combined Drills, Reamers as Taps. Huntington Emery Wheel Dressers. "Track Gauges. Hy-Rib Metal Sheathing. Hydrants, Crescent. "Fire, Fairbanks. Hydrants and Washers, Wall, Star. Hydraulic Cast Iron Fittings. "Coil Packing, Semibronze. "Couplings, Wrought Iron. "Dredges. |
| Hydronte and Washers Wall Star |
| Hydraulic Cast Iron Fittings |
| " Coil Packing Semibronge |
| " Couplings Wrought Iron |
| " Dredges |
| " Duck Packing |
| " Gauge Check Valves |
| " Gauges |
| " Giant Nozzles |
| " Head Punches |
| " Jacks, Duff-Bethlehem |
| " Malleable Iron Fittings |
| " Malleable Iron Unions |
| Manteable Fion Chiona |
| Couplings, wrought fron Dredges Duck Packing Gauge Check Valves Gauges Giant Nozzles Head Punches Jacks, Duff-Bethlehem Malleable Iron Fittings Malleable Iron Unions. Rail Benders |
| " Rail Benders |
| Rail Benders Rail Punches Rams |
| Rail Benders Rail Punches Rams Relief Valves, American |
| Rail Benders Rail Punches Rams Relief Valves, American Ring Packing, Waterproof, Improved |
| Rail Benders Rail Punches Rams Relief Valves, American Ring Packing, Waterproof, Improved Steel Fittings Whool Pressus |
| Rail Benders Rail Punches Rams Relief Valves, American Ring Packing, Waterproof, Improved Steel Fittings Wheel Presses |
| " Rail Punches " Rams " Relief Valves, American " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses |
| " Rail Punches. " Rams. " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings. " Wheel Presses. "I" Beams, Extrason. |
| " Rail Punches. " Rams. " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings. " Wheel Presses. "I" Beams, Extrason. |
| "Rail Punches Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Bitter Packing |
| "Rail Punches Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Bitter Packing |
| "Rail Punches Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Bitter Packing |
| "Rail Punches "Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's |
| "Rail Punches "Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's |
| "Rail Punches "Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's |
| "Rail Punches "Rams "Relief Valves, American "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's Improved Bevels "Grate Bars Levels "Ring Packing "Ring Packing |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |
| "Rail Punches "Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason 'I" Beams, Extrason 'I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's Improved Bevels "Grate Bars Levels "Grate Bars Levels "Ring Packing "Saw Tools "Seales "Sectional Ring Packing "Spiral Packing, Helicoid "Valve Outlet Pipe "Waterproof Hydraulic Ring Packing Incandescent Lamps Independent Sight Feeds Indeved Drill Cases Indeved Drill Cases Indeved Crank Indicator Cocks |
| "Rail Punches "Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason 'I" Beams, Extrason 'I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's Improved Bevels "Grate Bars Levels "Grate Bars Levels "Ring Packing "Saw Tools "Seales "Sectional Ring Packing "Spiral Packing, Helicoid "Valve Outlet Pipe "Waterproof Hydraulic Ring Packing Incandescent Lamps Independent Sight Feeds Indeved Drill Cases Indeved Drill Cases Indeved Crank Indicator Cocks |
| "Rail Punches "Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason 'I" Beams, Extrason 'I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's Improved Bevels "Grate Bars Levels "Grate Bars Levels "Ring Packing "Saw Tools "Seales "Sectional Ring Packing "Spiral Packing, Helicoid "Valve Outlet Pipe "Waterproof Hydraulic Ring Packing Incandescent Lamps Independent Sight Feeds Indeved Drill Cases Indeved Drill Cases Indeved Crank Indicator Cocks |
| "Rail Punches "Rams "Relief Valves, American "Ring Packing, Waterproof, Improved "Steel Fittings "Wheel Presses "I" Beams, Extrason 'I" Beams, Extrason 'I" Beams, Steel, Standard, Weight of Ideal Heating Boilers "Piston Packing "Red Tubular Gaskets "Saw Mill Dogs, Knight's Improved Bevels "Grate Bars Levels "Grate Bars Levels "Ring Packing "Saw Tools "Seales "Sectional Ring Packing "Spiral Packing, Helicoid "Valve Outlet Pipe "Waterproof Hydraulic Ring Packing Incandescent Lamps Independent Sight Feeds Indeved Drill Cases Indeved Drill Cases Indeved Crank Indicator Cocks |
| " Rail Punches " Rams " Relief Valves, American. " Ring Packing, Waterproof, Improved " Steel Fittings " Wheel Presses "I" Beams, Extrason "I" Beams, Extrason "I" Beams, Steel, Standard, Weight of Ideal Heating Boilers. " Piston Packing " Red Tubular Gaskets " Saw Mill Dogs, Knight's Improved Bevels " Grate Bars " Levels " Ring Packing " Saw Tools |

| Page | Dom |
|---|--|
| Page | Page |
| Information, Useful | Iron Body Safety Valves |
| Ingersoll-Rand Air Compressors | Body I prottle Valves, Lunkenneimer 8 |
| Ingots, Copper | " Rody Values Extra Heavy 94-26 04 0 |
| Injector Repairs, Metropolitan 180 Repairs, Penberthy 177 | " Body Valves, Inkins 90 |
| " Repairs, U. S 179 | " Body Valves, Jenkins Bros |
| " Strainers 185 | "Body Throttle Valves, Lunkenheimer. 8." Body Throttle Valves, Standard. 8." Body Valves, Extra Heavy 84-86, 94, 9. Body Valves, Jenkins |
| Injectors, Auto-Positive, Penberthy 176, 177 | Body Valves, Lunkenheimer. 82, 83, 86, 91, 92 Body Valves, Regrinding, Lunkenheimer. 83 Body Valves, Pratt & Cady |
| ** Automatic, Metropolitan | "Body Valves, Pratt & Cady |
| Automatic, Penberthy | Body Valves, Standard |
| Double Tube, Universal, Korting 182 | Body water Relief Valves |
| Metropolitan | " Coment Smooth On |
| " II 9 170 | " Classification 503 504 |
| Metropolitan | " Cocks |
| Inside Micrometers 849 | " Folders, Sheet |
| Inspection Motor Cars 537 | " Frame Shingle Bunchers |
| Inspectors' Rules | " Gong Whistles |
| Inspectors' Rules 568 Test Gauges 143 Torches 209 Inspirators, Hancock 183 | Lugs 1009 |
| Torches | Machine Screws |
| Inspirators, Hancock | " Poofing Commented 605 |
| Inverted Swing Saws 1095 Involute Cutters 754-756 Iron, Classification of 593, 594 | |
| Iron Classification of 593 594 | " Set Screws 613 |
| " Flat. Weight of | " Set Screws 613 " Sheaves, Dodge 379 " Syphons 104 |
| " Flat, Weight of | " Syphons 104 |
| " Sheet. 584 " Sheet, Weight per Square Foot. 584 | "Tiller Rope 388 Irons, Branding, Adjustable 570 "Calking 573 |
| " Sheet, Weight per Square Foot 584 | Irons, Branding, Adjustable |
| Square, Weight of 588 Iron Awning Sheets, Corrugated 605 | " Calking 573 |
| Fron Awning Sheets, Corrugated 605 | Toggle. 474 "Yarning 577 Irregular Knives 1037 Iwan Earth Augers 1013 |
| Body Angle Valves, Extra Heavy 84 Body Angle Valves, Jenkins Bros 80 | I arming |
| | Iwan Earth Augers 1013 |
| " Body Angle Valves, Safety 112 | 1 |
| " Body Angle Valves, Standard 78 | JACK Frost Covering |
| " Body Back Pressure Valves129, 130 | JACK Frost Covering |
| Body Angle Valves, Safety | Jacker Chain, Log |
| Body Butterfly Valves, Lunkenheimer. 87 | " Dogs, Log |
| Body Check Valves, Angle, Jenkins | Tookers, Log |
| Body Check valves, Angle, Jenkins | Sprockets, Log. 1083 Jackers, Log. 1082 Jacks, Bridge 438 "Hydraulic, Duff-Bethlehem 441 Lowering, Automatic, Barrett 437 "Planer, Armstrong 828 Darbett Borrett 427 Barrett 427 |
| Bros. 81 Body Check Valves, Angle, Lunken- | "Hydraulic, Duff-Bethlehem 441 |
| heimer | " Lowering, Automatic, Barrett 437 |
| heimer | " Planer, Armstrong 828 |
| Bros | " Ratchet, Barrett |
| " Body Check Valves, Horizontal, Lunken- | " Ratchet, Duff439, 440 |
| heimer | " Ratenet, Norton |
| | Planer, Armstrong 822 Ratchet, Barrett 437 Ratchet, Duff 439, 440 Ratchet, Norton 438 Screw, Telescope, Duff 440 Track, Lowering 437 Jackson Oilers 206 Jacob's Improved Drill Chucks 767 Jarecki Pipe Machines 808 Pipe Viese 816 Pipe Viese 8 |
| * Body Check Valves, Swing, Extra Hea- | Jackson Oilers 206 |
| vv | Jacob's Improved Drill Chucks |
| " Body Check Valves, Swing, Hydraulic 85 | Jarecki Pipe Machines 809 |
| " Body Check Valves, Swing, Jenkins Bros. 81 | " Pipe Vises |
| Body Check Valves, Swing, Lunken | Jaw Clutch Shafting Couplings, Dodge 410 |
| heimer | Jaws, Face Plate, Cushman |
| Body Check Valves, Swing, P & C 81 | Fipe vises |
| Body Check Valves, Swing, P & C 81 Body Check Valves, Swing, Standard 79 Body Check Valves, Vertical, Jenkins | Jelco Glass Tube Cutters 157 |
| Bros | Jelco Glass Tube Cutters |
| 4 D 1 O1 1 7 1 7 1 1 0 1 1 0 0 | " Brass Gate Valves |
| " Body Cross Valves, Jenkins Bros 80 | " Bros. Blow-Off Valves |
| Body Cross Valves, Vertical, Standard. 79 Body Cross Valves, Penkins Bros. 80 Body Cross Valves, Lunkenheimer. 82, 86 Body Cross Valves, Safety. 112 Body Cross Valves, Standard. 78 Body Expansion Joints. 137 Body Expansion Joints, Extra Heavy. 138 Body Foot Valves. 97 Body Gate Valves, Extra Heavy. 94, 95 Body Gate Valves, Extra Heavy. 90 | "Brass Gate Valves |
| Body Cross Valves, Safety | " Bros. Iron Body Valves80, 81 |
| Body Cross Valves, Standard | |
| Body Expansion Joints | Flexible Joints. 138 " Iron Body Valves 90 Jet Pumps, Blakeslee 188 " Pumps, Penberthy 188 |
| " Rody Foot Valves 07 | Jet Pumps Blakeslee 185 |
| " Body Gate Valves, Extra Heavy 94.95 | " Pumps, Penberthy |
| DOUG VAIVES, JUINIUS SU | Jewelers' File Handles 662 |
| Body Gate Valves, Lunkenheimer91, 92 | Jim Crow Rail Benders |
| " Body Gate Valves, Outside Screw and | Jobbers' Reamers712, 713 |
| Yoke 93 | Jewelers File Handles 660 Jim Crow Rail Benders 527 Jobbers Roamers 712, 713 Straight Way Drills 684 Twist Drills 688 Twist Drills 689 Twist Drills 680 Twis |
| Yoke 93 Body Gate Valves, Pratt & Cady 90 Body Gate Valves, Spur Geared 93 | 1 Wist Drills |
| | " Twist Drills in Sets. 699 Joint Clamps, Steam, Climax. 274 " Link Leather Belting, American Patent. 27 |
| Body Globe Valves, Extra Heavy 94 | " Link Leather Belting, American Patent 27 |
| " Body Globe Valves, Jenkins Bros. 80 | " Runners, Asbestos |
| Body Globe Valves, Lunkenheimer82, 86 | " Runners, Asbestos |
| Body Globe Valves, Standard. Body Globe Valves, Jenkins Bros. Body Globe Valves, Lunkenheimer. 82. 86 Body Globe Valves, Standard. 78 Body Globe Valves, Standard. | Jointers, Stave |
| " Body Pop Safety Valves, American | Jointers and Planers |
| Body Relief Valves, Water. 118 | Joints, Angle, Cast Iron |

THE CAMERON & BARKLEY CO.

| | Page |
|--|---|
| Joints, Ball, Flexible Expansion, Brass. Expansion, Iron Body. Expansion, Iron Body, Extra Hes Flexible, Cast Iron. Pipe, Spiral Riveted. Smooth-On. Swing, Brass, Lunkenheimer. | 237 |
| " Expansion, Brass | 137 |
| " Expansion Iron Body | vy 137 |
| " Flexible, Cast Iron | 139 |
| " Pipe, Spiral Riveted | 232 |
| " Smooth-On | 22 |
| Judson Governors | 135 |
| " Powder | 571 |
| " Powder | 1078 |
| Jumpers, Fire | 59 |
| Jumpers, Fire Jute Packing K | |
| | |
| Kelly Grinding Mills | |
| " Pneumatic Tanks | 1000 |
| Kelly Grinding Mills Kewanee Flange Unions Pneumatic Tanks Unions, Malleable Iron Water Supply System | 254 |
| Water Supply System Key-Seat Clamps Rules Rules Key-Seating Machines | |
| Key-Seat Clamps | 840 846 |
| Key-Seating Machines | 914, 915 |
| Shafting | 394 |
| Keyhole Calipers | 851 |
| " Service Box | 1019 |
| Keys, Center. Service Box. Spring, Flat. Keystone Bar Folders. Connecting Links. Drilling Posts | 645 |
| Keystone Bar Folders | |
| " Orilling Poets | 565 |
| " Ratchet Socket Wrenches | 519 |
| " Ratchet Tap Wrenches | 521 |
| " Reversible Ratchets | 518, 519 |
| "Strainer Connections | 125 |
| Kilns, Dry, Standard | 1089 |
| King Tube Scrapers | 40 |
| Knife Balancing Machines | 1042 |
| the Charles D. Male Townson | |
| Grinders, Bumaio Improved | 1062 |
| Grinders, Planer, Automatic | 1062 |
| "Grinders, Blaner, Automatic "Handle Wrenches | 1062 1063 786 |
| Grinders, Bulmaio Improved. "Grinders, Planer, Automatic" "Handle Wrenches. "Sharpeners, Carborundum, | 1062 786 670 1049 |
| Grinders, Bumaio Improved. Grinders, Planer, Automatic. Handle Wrenches Sharpeners, Carborundum, Knight's Ideal Saw Mill Dogs. Knives, Barker | |
| Grinders, Bumaio Improved. Grinders, Planer, Automatic. Handle Wrenches. Sharpeners, Carborundum, Knight's Ideal Saw Mill Dogs. Knives, Barker Belt | |
| Grinders, Bumaio Improved. Grinders, Planer, Automatic. Handle Wrenches Sharpeners, Carborundum, Knight's Ideal Saw Mill Dogs. Knives, Barker Belt Irregular Jointer. | |
| Grinders, Bumaio Improved. Grinders, Planer, Automatic. Handle Wrenches Sharpeners, Carborundum, Knight's Ideal Saw Mill Dogs. Knives, Barker Belt. Irregular. Jointer. Machine. | |
| Connecting Links Connecting Links Trilling Posts Ratchet Socket Wrenches. Ratchet Tap Wrenches. Reversible Ratchets. Kieley Pressure Regulating Valves Strainer Connections Kilns, Dry, Standard King Tube Scrapers Water Meters Grinders, Bufflalo Improved Grinders, Bufflalo Improved Grinders, Rufflalo Improved Handle Wrenches Sharpeners, Carborundum, Knight's Ideal Saw Mill Dogs Knives, Barker Belt. Tregular Jointer Machine Planer. | |
| Grinders, Bumaio Improved. Grinders, Planer, Automatic. Handle Wrenches. Sharpeners, Carborundum, Knight's Ideal Saw Mill Dogs. Knives, Barker Belt. Irregular Jointer. Machine Planer Shingle Stave | |
| " Shingle Stave | 1035-1037 1035, 1036 1035, 1036 1035, 1036 |
| "Shingle Stave Straight | 1035-1037 1035, 1036 1035, 1036 1035, 1036 |
| "Shingle Stave Straight | 1035-1037 1035, 1036 1035, 1036 1035, 1036 |
| "Shingle Stave Straight | 1035-1037 1035, 1036 1035, 1036 1035, 1036 |
| "Shingle Stave Straight | 1035-1037 1035, 1036 1035, 1036 1035, 1036 |
| "Shingle Stave Straight | 1035-1037 1035, 1036 1035, 1036 1035, 1036 |
| Planer Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins Knowles Steam Pumps Knurling Tools, Armstrong Körting Universal Double Tube Injector Kueisser's Belt Cement | . 1035-1036 . 1035, 1036 . 1035, 1036 . 1035, 1036 1037 1036 |
| Planer Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins Knowles Steam Pumps Knurling Tools, Armstrong Körting Universal Double Tube Injector Kueisser's Belt Cement | . 1035-1036 . 1035, 1036 . 1035, 1036 . 1035, 1036 1037 1036 |
| Planer Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins Knowles Steam Pumps Knurling Tools, Armstrong Körting Universal Double Tube Injector Kueisser's Belt Cement | . 1035-1036 . 1035, 1036 . 1035, 1036 . 1035, 1036 1037 1036 |
| Planer Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins Knowles Steam Pumps Knurling Tools, Armstrong Körting Universal Double Tube Injector Kueisser's Belt Cement | . 1035-1036 . 1035, 1036 . 1035, 1036 . 1035, 1036 1037 1036 |
| Planer Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins Knowles Steam Pumps Knurling Tools, Armstrong Körting Universal Double Tube Injector Kueisser's Belt Cement | . 1035-1036 . 1035, 1036 . 1035, 1036 . 1035, 1036 1037 1036 |
| Flaner. Shingle Stave Straight Tobacco. Veneer Knot Saws. Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong. Körting Universal Double Tube Injector Kueisser's Belt Cement. LACE Leather Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt. | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1106 950, 951 158 182 33 31 31 33 33 |
| Flaner. Shingle Stave Straight Tobacco. Veneer Knot Saws. Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong. Körting Universal Double Tube Injector Kueisser's Belt Cement. LACE Leather Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt. | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1106 950, 951 158 182 33 31 31 33 33 |
| Planer. Shingle Stave Straight Tobacco Veneer. Knot Saws, Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong. Körting Universal Double Tube Injector Kueisser's Belt Cement. LACE Leather Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt. Cuthus, Belt. Ladles. Ladles. Ladg Screws. | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1106 950, 951 182 39 39 31 31 35 31 33 31 33 31 35 35 |
| Planer. Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong Korting Universal Double Tube Injecto Kueisser's Belt Cement LACE Leather Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt Ladles. Lag Screws. Lagno Chimneys | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 11037 1035, 1036 1106 950, 951 828 828 39 31 31 31 33 31 33 31 33 31 35 31 35 31 35 36 32 |
| Planer. Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong Korting Universal Double Tube Injecto Kueisser's Belt Cement LACE Leather Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt Ladles. Lag Screws. Lagno Chimneys | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 11037 1035, 1036 1106 950, 951 828 828 39 31 31 31 33 31 33 31 33 31 35 31 35 31 35 36 32 |
| Planer. Shingle Stave Straight Tobacco Veneer Knot Saws, Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong Korting Universal Double Tube Injecto Kueisser's Belt Cement LACE Leather Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt Ladles. Lag Screws. Lagno Chimneys | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 11037 1035, 1036 1106 950, 951 828 828 39 31 31 31 33 31 33 31 33 31 35 31 35 31 35 36 32 |
| Planer. Shingle Stave Straight Tobacco Veneer. Knot Saws, Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong. Körting Universal Double Tube Injecto Kueisser's Belt Cement. LACE Leather. Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt. Ladles. Lag Screws. Lamp Chimneys Lamps, Dietz Edison Base, Standard. Hand, Malleable Iron. Incandescent. | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1106 1106 1106 1106 1106 1106 1106 |
| Planer. Shingle Stave Straight Tobacco Veneer. Knot Saws, Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong. Körting Universal Double Tube Injecto Kueisser's Belt Cement. LACE Leather. Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt. Ladles. Lag Screws. Lamp Chimneys Lamps, Dietz Edison Base, Standard. Hand, Malleable Iron. Incandescent. | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1106 1106 1106 1106 1106 1106 1106 |
| Planer. Shingle Stave Straight Tobacco Veneer. Knot Saws, Perkins. Knourling Tools, Armstrong. Körting Universal Double Tube Injecto Kueisser's Belt Cement Lace Leather Lutters. Lacing, Belt, Metallic Belt, Steel, Bristol's. Cut Machines, Belt Moufits, Belt. Lag Screws Lamp Chimneys Lamps, Dietz Edison Base, Standard. Hand, Malleable Iron Incandescent. Mazda Steel. Steel. | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1106 1106 1950, 951 182 39 39 31 31 33 31 33 31 31 32 31 31 32 31 31 32 31 31 31 32 31 31 31 32 31 31 31 31 31 31 31 31 31 31 31 31 31 |
| Flaner. Shingle Stave Straight Tobacco Veneer. Knot Saws, Perkins. Knowles Steam Pumps. Knurling Tools, Armstrong. Körting Universal Double Tube Injector Kueisser's Belt Cement. LACE Leather Lace Leather Cutters. Lacing, Belt, Metallic. Belt, Steel, Bristol's. Cut. Machines, Belt. Cut. Ladles. Ladles. Ladles. Ladles. Lamps, Dietz Fision Base, Standard. Hand, Malleable Iron Incandescent. Mazda Steel. | 1035-1036 1035, 1036 1035, 1036 1035, 1036 1035, 1036 1106 1106 1106 1106 1106 1106 1106 |

xxiv

| Lantern Globes Lanterns, Beacon Light "Dietz Railroad Tubular Lap Links "Welded Casing Lariat Rope Lath Binders and Trimmers "Mills, Gang "Yarn, Sisal Lathe Centers "Chucks, Skinner "Chucks, Union | I | Page |
|---|-----------|---|
| Lantern Globes | • • • • | 213 |
| " Dietz | | 214 |
| " Railroad | | 214 |
| "_Tubular | • • • • | 214 |
| " Welded Casing | • • • • | 225 |
| Lariat Rope | | 376 |
| Lath Binders and Trimmers |] | 1108 |
| " Vorn Sign! | • • • • • | 376 |
| Lathe Centers | | 681 |
| " Chucks | . 769- | -777 |
| " Chucks, Skinner | .774- | -776 777 |
| " Chucks Westcott | 772. | 773 |
| " Dogs, Drop Forged | | 823 |
| " Face Plates | | 772 |
| Mandrels, Expanding, Nicholson | | 681 |
| " Tool Tongs | | 544 |
| Lathes, American | .898 | -903 |
| " Screw Cutting, Star | • • • • | 905 |
| Lawn Rollors | | 486 |
| " Sprinklers | | 60 |
| Lea-Simplex Cold Metal Saws | | 532 |
| Lead, Bar | • • • • | 514 |
| " Pig " Red | | 22 |
| Red. Sheet. White. Melting Furnaces. Pipe. | | 318 |
| " White | • • • • | 22 516 |
| " Pine | | 318 |
| Leather, Lace | | 31 |
| " Pump | | 1012 |
| " Belting | 28 | 5-27 |
| " Fillets | | 582 |
| Leathers, Plunger, Pump | | 1012 |
| Melting Furnaces. Pipe. Leather, Lace. Pump. Belting. Cutters, Lace. Fillets. Leathers, Plunger, Pump. Valve, Pump. Leaves and Hearts. Leg Vises, Fisher. Letter Size Twist Drills in Sets. Letters, Pattern. Size Twist Drills in Sets. Letters, Pattern. Steel Level Boards, Step. Leveling Tables, Sawmakers' Levels, Bench. Cross-Test Electricians' Engineers' Improved. Plumbers' Pocket. Lever Sate Valves, Brass, Handy, Luryer, Cate | | 1012 |
| Leg Vises Fisher | · · · · | 816 |
| Letter Size Twist Drills | | 685 |
| " Size Twist Drills in Sets | · · · • | 699 |
| " Steel | | 570 |
| Level Boards, Step | | 526 |
| Leveling Tables, Sawmakers' | 1 | 1047 |
| Levels, Bench | • • • • | 863 |
| " Electricians' | | 863 |
| " Engineers' | | 864 |
| "Improved | | 863 |
| " Plumbers' | • • • • | 863 |
| Pocket Lever Gate Valves, Brass, Handy, Lur heimer Gate Valves, Iron Body, Handy, kenheimer Throttle Valves, Brass, Lunkenheim Throttle Valves, Iron Body, Lur | ken- | |
| heimer | · · · · | 75 |
| " Gate Valves, Iron Body, Handy, | Lun- | 87 |
| " Throttle Valves, Brass, Lunkenheim | er | 87 75 |
| "Throttle Valves, Iron Body, Lur | ıken- | ~- |
| heimer | 200 | 220 |
| " Bushed Chain Sprocket Wheels | . 323, | 314 |
| " Bushed Chain Traction Wheels | | 347 |
| Lidgerwood Belt Hoists | | 459 |
| " Hoisting Engines | 455 | 400 458- |
| Lift Pumps | 983 | 984 |
| " Pumps, House | | 987 |
| Lifters, Moulders' | . 575, | , 576 785 |
| " Conton Doomond | | |
| | | 733 |
| " Portable Hand Punches and Shears | | 733 549 |
| Portable Hand Punches and Shears. Taper Reamers. | | 733 549 733 |
| " Portable Hand Punches and Shears." Taper Reamers. Line Pipe. Linen Corded Measuring Tanes | | 733 549 733 224 868 |
| Portable Hand Punches and Shears Taper Reamers Line Pipe Linen Corded Measuring Tapes Hose | | 733 549 733 224 868 48 |
| kenheimer Throttle Valves, Brass, Lunkenheim Throttle Valves, Iron Body, Lurheimer Ley Bushed Chain Sprocket Wheels Bushed Chain Traction Wheels Bushed Chain Traction Wheels Lidgerwood Belt Hoists Hoisting Engines Lift Pumps Pumps, House Lifters, Moulders' Lightning Adjustable Tap Wrenches Center Reamers Portable Hand Punches and Shears Taper Reamers Linen Corded Measuring Tapes Hose Liners and Protractors, Section Lining, Conveyor Box. | | 733 549 733 224 868 48 846 353 |

| • | Page |
|---|--------------|
| Lining Bars Link Chain Conveyors, Steel Leather Belting, Joint, American Patent Links, Attachment | 523 |
| Link Chain Conveyors, Steel | 350 27 |
| Links. Attachment323 | -328 |
| " Connecting | 565 565 |
| List of Drill Shanks and Sockets | 683 |
| Little Giant Cutting and Tapping Machines | 013 |
| " Giant Drill Chucks | 766 |
| "Giant Reversible Piston Air Drills | 501 -783 |
| Live Roll Drive Rigs | 1080 |
| ** Rolls | 1079 563 |
| Loading Carriages | 449 |
| " Devices, Barrel, Andrus | 351 257 |
| Lock Joint Calipers | 852 |
| " Joint Dividers | 853 -636 |
| Locks, Locomotive | 143 |
| Locomotive Clocks | 631 143 |
| " Gauges | 142 |
| " Jack Screws | 215 436 |
| " Lubricators, Sight Feed | 199 |
| " Cti Cups | , 188 719 |
| " Torches | 209 |
| Locomotives, Contractors', Porter | 541 381 |
| Haul-Ups, Friction | 1081 |
| " Jacker Chain" " Jacker Dogs | 1083 1083 |
| " Jacker Foot Wheels | 1083 |
| " Jacker Sprockets | 1083 1082 |
| " Marking Hammers | 570 |
| " Rules | 568 380 |
| Lombard Phosphate Dryers | 1129 |
| Long Sween Cast Iron Fittings | .278 |
| Low Pressure Safety Valves | 112 |
| " Water Alarms | , 956 158 |
| Lowering Jacks, Automatic, Barrett | 437 |
| Lubricator, Sheet, Graphite, Randall | 22 24 |
| Lubricators, Brass, Detroit | , 198 |
| " Locomotive, Sight Feed | 198 |
| " Sight Feed, Detroit | , 198 |
| " Sight Feed, Lunkenheimer196 | , 198 |
| Lug Hooks Passet Hooks Passet Hooks | 562 |
| Iron | 1009 |
| "Jacker Dogs. "Jacker Sprockets. "Jacker Sprockets. "Jacker Sprockets. "Jackers. "Marking Hammers. "Rules. Logging Chain. Lombard Phosphate Dryers. "Wood Splitting Machines. Long Sweep Cast Iron Fittings. "Service Pumps, Fairbanks-Morse. "1955. "Brass, Lunkenheimer. "1966. "Lubricators, Brass, Detroit. "Sight Feed, Glass Body. "Sight Feed, Glass Body. "Sight Feed, Glass Body. "Sight Feed, Lunkenheimer. "1968. "Sight Feed, Lunkenheimer. "1968. "Gauges. "Sorters' Pickaroons. "Trucks. "Lumber Crayons. "Gauges. "Sorters' Pickaroons. "Trucks. "Lumbering Tool Repairs. "Tools. "Sorters' Pickaroons. "Trucks. "Lumbering Tool Repairs. "Tools. "Sorters' Pickaroons. "Trucks. "Lumbering Tool Repairs. "Tools. "Sorters' Pickaroons. "Trucks. "Brass Oil Cups. "Brass Swing Joints. "Brass Swing Joints. "Brass Valves. "Brass Oil Cups. "Brass Gate Valves, Brass. "Gate Valves, Brass. "Oil Pumms. "Oil Pumms. | 1009 |
| " Gauges | 568 |
| " Sorters' Pickaroons | 561 538 |
| Lumbering Tool Repairs | 560 |
| " Tools | -567 1132 |
| " Cotton Presses | 1133 |
| Lunkenheimer Brass Gate Valves | 77 188 |
| Brass Swing Joints | 125 |
| " Brass Valves | 9-71 160 |
| " Clip Gate Valves | 91 |
| " Gate Valves, Brass | 75 87 |
| " Glass Oil Cups | -191 |
| " Iron Body Valves | 1,92 158 |
| " Oil Pumps | 201 |

| | | | Page |
|-----------|--|---------------|----------------|
| Lunk | enheimer Oiling Devices | 102 | 104 |
| ** | Sight Feed Lubricators | 196 | 3, 198 |
| ** | Throttle Valves Brass | | . 186 75 |
| " | Throttle Valves, Iron Body | . | 87 |
| Lyma | Sight Feed Lubricators Steel Oil Cups Throttle Valves, Brass Throttle Valves, Iron Body n Exhaust Pipe Heads | | 175 |
| | | | |
| Mach | Iron Elevator Buckets, Malleable ine Bits | 700 |). 701 |
| " | Bits in Sets | | 699 |
| •• | Dies | | 780 |
| ** | Expansion Bolts | | 630 |
| •• | Handle Forgings | | 832 |
| :: | Knives | 1035- | -1037 |
| ** | Screw Taps | | 761 |
| ** | Screws, Brass | | 609 |
| ** | Screws, Iron | <i></i> . | 608 |
| Mach | inery, Cutting, Veneer | i iòi. | 1102 |
| | Filing Room | 1054- | -1061 |
| 36k | Saw Mill | 1064- | -1088 |
| Mach | inery woodworking | 1091- 527 | -1100 7 598 |
| ******** | Bending, Rail, Hydraulic | | 529 |
| ** | Bolt Cutting, Little Giant | 912 | 913 |
| ** | Drilling Angular and Ratchet | | 590 |
| •• | Excelsior, Self Contained | | 1134 |
| ** | Filing, Saw, Band | | 1061 |
| :: | Grinding | | 1062 |
| ** | Knife. Balancing | 914 | 1042 |
| •• | Lacing, Belt | | 38 |
| ** | Milling | 909 | -911 |
| •• | Pine Armstrong | 912 806 | 2,913 1 207 |
| ** | Pipe, Jarecki | | 809 |
| •• | Pipe Cutting, Armstrong | 80€ | , 807 |
| ** | Reseating Value Dorter | | 1114 |
| ** | Saw, Drag, Perkins Champion | | 1105 |
| ** | Scarfing, Band Saw | | 1058 |
| | Shingle, Perkins | | 1103 |
| ** | Spraying | | 998 |
| 44 | Straightening, Rail | | 528 |
| :: | Tapping, Water Main | | 513 |
| ** | Tinners' | 7. 880 | . 808)-882 |
| •• | Tongue and Groove | | 1110 |
| ** | Turning, Tinners' | . | 877 |
| | Wiring Tippers' | | 998 877 |
| Mach | inist's Center Punches | | 862 |
| " | Iron Elevator Buckets, Malleable. ine Bits. Bits in Sets. Bolts. Dies. Expansion Bolts. Handle Forgings. Knives. Oil. Screws, Brass. Screws, Brass. Screws, Iron. Taps. Inery, Cutting, Veneer. Filing Room. Saw Mill Inery Woodworking. Inery Woodworking. Inery Moodworking. Inery Moodworking. Inery Moodworking. Inery Bending, Rail. Bending, Rail. Bending, Rail, Hydraulic. Bolt Cutting, Little Giant. Burring, Tinners' Drilling, Angular and Ratchet. Excelsior, Self Contained Filing, Saw, Band. Grinding. Key-Seating. Kunife, Balancing Lacing, Belt. Milling. Nut Tapping, Little Giant. Pipe, Armstrong. Pipe, Jarecki. Pipe Cutting, Armstrong. Re-Saw, Drag, Perkins Champion. Scarfing, Band Saw Shingle, Perkins. Splitting, Wood Spraying. Straightening, Rail. Tapping, Water Main. Threading, Pipe, Forbes Patent. Tinners'. Tongue and Groove. Turning, Tinners'. Whitewashing. Wiring, Tinners'. Inist's Center Punches. Clamps Forges. Hammers. Hand Taps. Scrapers. Straight Way Drills. Vises. Vi | | 822 |
| ** | rorges | | 552 |
| •• | Hand Taps | 757 | 7. 758 |
| " | Scrapers | | 662 |
| ** | Straight Way Drills | | 694 |
| Maga | zine Screw Drivers | 1, 812 | 862 862 |
| Magic | Pattern Rules | | 867 |
| Mean | Steam Flue Cleaners | . . | 42 |
| 141 WR.11 | Covering | 9 | . 18 20. 21 |
| Magn | olia Babbitt Metal | | 515 |
| Mai | White Sheet Packing | <i></i> . | 12 |
| Malle | able Iron Boiler Fittings | | 253 |
| | Iron Fittings | . 244 | -253 |
| ** | Iron Fittings, Extra Heavy | | 255 |
| | Iron Flange Unions | | 255 |
| ** | Iron Hand Lamps | | 209 |
| " | Iron Pipe Clamps | | .273 |
| •• | Iron Pipe Saddles | 984 | . 273 |
| ** | Iron Shell Snatch Blocks | 230 | 7-∠39 443 |

| 1 | Page |
|--|--------------|
| Mallachia Iron Chall Tackia Dicaka | 444 |
| " Iron Union Elbows | 253 |
| " Iron Union Tees | 253 |
| "Iron Union Elbows "Iron Union Tees "Iron Unions. Extra Heavy "Iron Unions, Extra Heavy "Iron Unions, Hydraulic. "Iron Washers. | 254 255 |
| " Iron Unions, Extra neavy | 255 |
| " Iron Washers | 635 |
| " M. S. Iron Elevator Buckets | 368 |
| " Roller Bushed Chain | 337 |
| " Roller Bushed Chain | 346 |
| "Stocks and Dies | 804 |
| Mammoth Gang Lath Mills | 1109 |
| Mandrels, Blacksmiths' | 545 |
| Expanding, Champion. Expanding, McCrosky | 831 831 |
| " Lathe Expanding Nicholson | 730 |
| " Expanding, McCrosky " Lathe, Expanding, Nicholson. " Saw, Circular | 1052 |
| " Taper Morse 737 | 738 |
| Manganese Steel, Tisco | 371 |
| " Steel Chain, Tisco | 372 |
| " Steel Gears, Tisco | 373 |
| Manhole Covers | 512 |
| | |
| Manila Rope | -378 |
| Rope Dressing | 378 |
| Rope Sheaves | 379 203 |
| "Rope Dressing "Rope Sheaves Manzel Mechanical Oil Pumps 202 Marine Clocks "Engines 15 Pumps 202 Marine Clocks "Engines 202 Marine Clocks "Rope Sheaves 15 Pumps 202 Marine Clocks "Rope Sheaves 202 Marine Clocks "Rope Sheav | 143 |
| " Fraince | 976 |
| " Engines " Fusible Plugs Markers, Belt | 158 |
| Markore Relt | 35 |
| Market Wire | .648 |
| Market Wire | .570 |
| Mars Sight Feed Lubricators | . 192 |
| Mason Balanced Valves | . 127 |
| " Pump Governors | . 132 |
| " Reducing Valves | . 123 |
| Massey's Planer Chucks | .779 |
| Mast Caps, Derrick | 460 |
| " Pump Governors. " Reducing Valves. Massey's Planer Chucks. Mast Caps. Derrick. " Tops, Derrick. " and Gaff Fittings, Derrick. Matcher Bits. | 469 |
| Matcher Bits | 1037 |
| Matcher Bits. Matchers, Moulders and Planers. Material, Building, Metal. | 1091 |
| Material, Building, Metal | 500 |
| Mattocks | . 503 |
| Maul Handles | . 511 |
| Mauls, Ship | .510 |
| Top Track, Railroad Maximum Silent Chain Gear | . 510 |
| Track, Railroad | .510 |
| Maximum Silent Chain Gear | .333 |
| Mazda Lamps McCrosky Expanding Mandrels | .831 |
| Measurement of Water in Pipes | 1139 |
| Measures | .210 |
| 4 m-11 | 1140 |
| Measuring Bar Clamps | .854 |
| " Tapes, Linen Corded | 868 |
| " Tapes, Metallic | 868 |
| Measuring Bar Clamps "Tapes, Linen Corded "Tapes, Metallic Mechanical Oil Pumps 202 Medium Pressure Coil Packing, Diagonal Expar | 203 |
| Medium Pressure Coil Packing, Diagonal Expan | 1- 7 |
| sion Melting Furnaces, Lead | 516 |
| " Furnaces, Tar | 516 |
| Mender Clamps, Hose | 52 |
| Menders, Hose | 52 |
| Merchant Pipe | .218 |
| Mercury Plumb Bobs | .864 |
| Menders, Hose Merchant Pipe Mercury Plumb Bobs Metal, Asbestos Protected | . 604 |
| " Babbitt | .515 |
| Metal, Asbestos Protected Babbitt. Perforated Metal Building Material | .598 .599 |
| " Edges, Adjustable | .838 |
| | 51 |
| (4 II C !! | 51 |
| " Polish | 673 |
| " Punches, Hand, Whitney | .549 |
| " Ridge Coping | .607 |
| Hose Couplings Polish Punches, Hand, Whitney Ridge Coping Saws, Cold, Lea-Simplex Sheathing, Hy-Rib Shingles, Stamped Siding | .532 |
| " Sheathing, Hy-Rib | . 599 |
| " Siding | .607 |

| | Pag | ζe |
|--|---|--|
| Metal Slates | 60 |)7 |
| " Workers' Crayons | 74 | 17 39 |
| Metallic Belt Lacing | | 31 |
| " Measuring Tapes | 8 | 38 |
| Meter Cocks, Gas, Brass | 10 | 7 |
| Meters, Oil, Worthington | 16 | 39 |
| " Water, King | 16 | 18 17 |
| " Water, Union | 16 | 38 |
| " Water, Worthington | 16 | 39 |
| Metropolitan Injector Repairs | 180 18 | 80 21 |
| Miami Glass Oil Cups | 18 | 9 |
| Micrometer Caliper Gauges | 84 | 19 |
| " Caliner Squares | 84 | 14 |
| " Stands | 84 | 18 |
| Mill Board Ashantas | 847-8 | 19 |
| " Brooms | 58 | 30 |
| " Dogs, Saw, Knight's Ideal | 104 | 19 |
| " Hose, Cotton | 4 50 | 18 |
| Milled Coupling Bolts. | 6 | 21 |
| Miller's Reversible Ratchet Stocks | 80 |)4 |
| Milling Cutters | 740-74 | 17 |
| " Machine Vises | 81 | 17 |
| " Machines | 909-9 | ii |
| " Tools, Hand, Vixen | 66 | 33 |
| " Cotter | 7! | 53 |
| " End | 750-7 | 52 |
| " Grinding11 | 25, 112 | 26 |
| " Lath Gang | 110 | ю M |
| " Saw American 16 | 40 10 | ,, |
| Daw, Millettean | 108, IU | Э |
| " Saw, Band | 100 |)¥ 34 |
| " Saw, Band | 068, 100 100 067, 100 | 54 58 58 |
| " Saw, Band | 068, 100 067, 100 100 | 54 58 58 18 |
| Saw, Band. Saw, Circular. 1065, 10 Saw, Lane. Mineral Wool. Wool Covering. | 085, 106 087, 106 106 106 | 54 58 58 18 21 |
| " Saw, Band | 068, 106 067, 106 106 106 49 | 34 38 37 18 38 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks | 106 067, 106 106 106 106 45 | 58 58 58 58 58 58 58 58 58 58 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor | | 54 58 58 58 58 58 58 58 |
| "Saw, Band." "Saw, Circular | | 54 58 58 58 58 58 58 58 58 |
| "Saw, Band" 1065, 10 "Saw, Circular 1065, 10 "Saw, Lane Mineral Wool "Wool Covering. Miners' Scales Mining Barrows Mississippi Gauge Cocks. Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Mixers, Concrete, Smith | 100 100 100 100 100 100 100 100 | 54 58 58 58 58 58 58 58 58 58 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Seales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All | 10067, 100 10067, 100 100 100 100 100 100 100 100 | 54 58 58 58 58 58 58 58 58 58 58 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Viscs | 100 100 100 100 100 100 100 48 48 48 48 48 48 48 48 48 48 | 584 587 588 588 588 588 588 588 588 588 588 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Wyrenches | 100 100 100 100 100 20, 3 41 48 10 482, 48 48 48 48 | 58 58 58 58 58 58 58 58 58 58 58 58 58 5 |
| Saw, Band "Saw, Circular 1065, 10 "Saw, Lane Mineral Wool "Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Mixers, Concrete, Smith "Concrete, X-L- All. Monarch Ratchets "Vises Monkey Wrenches Moran Flexible Joints Morrill, Saws Sets | 100 100 100 100 100 100 100 100 100 100 | 54 54 58 58 58 58 58 58 58 58 58 58 58 58 58 |
| Saw, Band "Saw, Circular "Saw, Lane Mineral Wool "Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Mixers, Concrete, Smith "Concrete, X-L- All. Monarch Ratchets "Viscs Monkey Wrenches Moran Flexible Joints Morrill's Saw Sets Morrill's Machine Works Centrifugal Pumps | 100 100 100 100 100 100 100 100 | 08 08 08 08 08 08 08 08 08 08 08 08 08 0 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Monkey Wrenches Moran Flexible Joints Morrill's Saw Sets Morris Machine Works Centerifugal Pumps Machine Works Cutter Engines | 100 100 100 100 100 20, 1 41 42 48 48 48 48 51 51 61 61 61 61 61 61 61 61 61 6 | 54 58 58 58 58 58 58 58 58 58 58 58 58 58 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Viscs Monkey Wrenches Moran Flexible Joints Morrili Saw Sets Morrili Saw Sets Morrili Saw Sets Morrili Saw Sets Morrili Machine Works Cutter Engines Machine Works Cutter Engines Machine Works Cutter Engines Machine Works Hydraulic Dredges | 100 100 100 100 100 20, 1 48 48 48 48 48 55 81 104 968-97 97 | 54568 54668 54668 5468 5468 5468 5468 54 |
| "Saw, Band "Saw, Circular 1065, IC "Saw, Circular 1065, IC "Saw, Lane Mineral Wool "Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Mixers, Concrete, Smith "Concrete, X-L- All Monarch Ratchets "Vises Morkey Wrenches Moran Flexible Joints Morrill Saw Sets Morrils Saw Sets Morrils Machine Works Centrifugal Pumps "Machine Works Hydraulic Dredges. "Machine Works Marine Engines "Machine Works Marine Engines "Machors Works Marine Engines | 100 100 100 100 100 20, 3 41 41 103 482, 48 482, 48 104 104 105 107 107 107 107 107 107 107 107 | 54 58 58 58 58 58 58 58 58 58 58 58 58 58 |
| "Saw, Band "Saw, Circular 1065, 10 "Saw, Lane Mineral Wool "Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Mixers, Concrete, Smith "Concrete, X-L- All. Monarch Ratchets "Vises Monkey Wrenches Moran Flexible Joints Morrill's Saw Sets Morrils Machine Works Cutter Engines "Machine Works Hydraulic Dredges "Machine Works Marine Engines "Morse Arbors "Bit Stock Drills | 100 100 100 100 100 20, 44 41 41 103 482, 48 48 58 104 482, 48 48 76 13 104 105 107 107 107 107 107 107 107 107 | 54 58 58 58 58 58 58 58 58 58 58 58 58 58 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Morns Plexible Joints Morrill's Saw Sets Morrils Machine Works Centrifugal Pumps Machine Works Hydraulic Dredges Machine Works Hydraulic Dredges Machine Works Marine Engines Morse Arbors Bit Stock Drills Counterbores | 100 100 100 100 20, 41 41 42, 41 482, 41 51 76 966–97 97 734–77 731–73 | 0945687 18687 18688 1868 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Monkey Wrenches Moran Flexible Joints Morril's Saw Sets Morril's Saw Sets Morril's Saw Sets Morril's Machine Works Centrifugal Pumps Machine Works Cutter Engines Machine Works Hydraulic Dredges Machine Works Mydraulic Dredges Machine Works Mydraulic Dredges Machine Works Marine Engines Morse Arbors Bit Stock Drills Cotter Mills Counterbores | 100 100 100 100 100 20, 41 41 482, 41 55 76 966 97 97 97 734 73 731, 73 730, 73 | 54537 54537 56853 56853 5687 5686 5687 577 577 577 577 577 577 577 577 577 5 |
| "Saw, Band "Saw, Circular 1065, IC "Saw, Circular 1065, IC "Saw, Lane Mineral Wool "Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Mixers, Concrete, Smith "Concrete, X-L- All Monarch Ratchets "Viscs Monkey Wrenches Moran Flexible Joints Morrill's Saw Sets Morrils Machine Works Centrifugal Pumps "Machine Works Centrifugal Pumps "Machine Works Centrifugal Pumps "Machine Works Centrifugal Pumps "Machine Works Marine Engines "Machine Works Marine Engines "Machine Works Marine Engines "Morse Arbors "Bit Stock Drills "Cotter Mills "Counterbores "Countersinks "Drill Cases "Drill Cases | 100 100 100 100 20, 1 48 48 48 48 48 48 48 48 48 48 | 54 58 58 58 58 58 58 58 58 58 58 58 58 58 |
| "Saw, Band "Saw, Circular 1065, IC "Saw, Circular 1065, IC "Wool Covering Mineral Wool "Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Mixers, Concrete, Smith "Concrete, X-L- All Monarch Ratchets "Vises Morkey Wrenches Moran Flexible Joints Morrill Saw Sets Morrils Saw Sets Morrils Machine Works Centrifugal Pumps "Machine Works Centrifugal Pumps "Machine Works Hydraulic Dredges. "Machine Works Marine Engines "Machine Works Marine Engines "Morse Arbors "Bit Stock Drills "Counterbores "Counterbores "Counterbores "Drill Cases "Drill Cases "Drill Sockets | 100 100 100 100 100 20, 3 48 48 48 48 48 48 48 48 48 48 | 54 58 58 58 58 58 58 58 58 58 58 58 58 58 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All. Monarch Ratchets Vises Morns Plexible Joints Morrill's Saw Sets Morris Revible Joints Morrill's Saw Sets Morris Machine Works Centrifugal Pumps Machine Works Hydraulic Dredges Machine Works Mydraulic Dredges Machine Works Marine Engines Morse Arbors Bit Stock Drills Counterbores Countersinks Drill Cases Drill Sockets Drill Sockets Drill Sockets End Mills | Nos, 100 100 100 100 100 100 100 100 100 100 | 55555555555555555555555555555555555555 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Morn Flexible Joints Morrill's Saw Sets Morris Machine Works Cutter Engines Machine Works Hydraulic Dredges Machine Works Mydraulic Dredges Machine Works Mydraulic Dredges Machine Works Mydraulic Dredges Machine Works Mydraulic Counterbores Counterbores Counterbores Countersinks Drill Sockets Drill Sockets Drill Sockets End Mills Hollow Mills Hollow Mills | Nos, 100 (100 (100 (100 (100 (100 (100 (100 | 55555555555555555555555555555555555555 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Mornkey Wrenches Moral Flexible Joints Morril's Saw Sets Morril's Saw Sets Morril's Nachine Works Centrifugal Pumps Machine Works Hydraulic Dredges Machine Works Marine Engines Machine Works Marine Engines Machine Works Marine Engines Morse Arbors Bit Stock Drills Counterbores Counterbores Countersinks Drill Cases Drill Sockets Drill Sockets Drills in Sets End Mills Hollow Mills Involute Cutters Let & Covery | Nos, 100 (100 (100 (100 (100 (100 (100 (100 | 55555555555555555555555555555555555555 |
| Saw, Band Saw, Circular Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Minsing Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Morkey Wrenches Moran Flexible Joints Morrill Saw Sets Morrils Saw Sets Morrils Machine Works Centrifugal Pumps Machine Works Cutter Engines Machine Works Hydraulic Dredges Machine Works Marine Engines Machine Works Marine Engines Morse Arbors Bit Stock Drills Counterbores Counterbores Counterbores Counterbores Counterbinks Drill Cases Drill Sockets Prills in Sets End Mills Hollow Mills Involute Cutters Lathe Centers Lathe Centers Lathe Sockets | Nos, 100 100 100 100 100 100 100 100 100 10 | 55555555555555555555555555555555555555 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All. Monarch Ratchets Vises Morns Plexible Joints Morrill's Saw Sets Morrils Machine Works Centrifugal Pumps Machine Works Hydraulic Dredges Machine Works Marine Engines Machine Works Marine Engines Machine Works Mills Counterbores Countersinks Drill Cases Drill Sockets Drill Sockets Drills in Sets End Mills Hollow Mills Hollow Mills Involute Cutters Lathe Cockets Lathe Cockets Machine Works Lathe Cockets Machine Wits Lathe Sockets Lathe Sockets Machine Wits Lathe Sockets Machine Wits | Nos, 100 100 100 100 100 100 100 100 100 10 | 55555555555555555555555555555555555555 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Mornhey Wrenches Moran Flexible Joints Morrill's Saw Sets Morrill's Saw Sets Morrill's Saw Sets Morris Machine Works Centrifugal Pumps Machine Works Hydraulic Dredges Machine Works Marine Engines Machine Works Marine Engines Counterbores Bit Stock Drills Countersinks Drill Sockets Drill Sockets Drill Sockets Drill Sockets Drill Sockets Lathe Couters Lathe Cockets Metal Slitting Saws Mills Motal Slitting Saws Mills Motal Slitting Saws Mills Motal Slitting Saws Mills Motal Slitting Saws Mills Mills Motal Slitting Saws Mills Mills Mills Mills Mills Mills Motal Slitting Saws Mills M | Nos, 100 (100 (100 (100 (100 (100 (100 (100 | 55555566666666666666666666666666666666 |
| Saw, Band Saw, Circular Saw, Lane Mineral Wool Wool Covering Miners' Scales Minsing Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor Gears Saws, Circular, Simonds Mixers, Concrete, Smith Concrete, X-L- All Monarch Ratchets Vises Morn Flexible Joints Morrill's Saw Sets Morrill's Saw Sets Morrill's Saw Sets Morris Machine Works Centrifugal Pumps Machine Works Hydraulic Dredges Machine Works Marine Engines Machine Works Marine Engines Morse Arbors Bit Stook Drills Counterbores Counterbores Countersinks Drill Cases Drill Sockets Drill Sockets Drill Sockets Drill Sockets Lathe Centers Lathe Cockets Machine Bits Metal Slitting Saws Milling Cutters Oil Drills Oil Drills | Nos, 100 (100 (100 (100 (100 (100 (100 (100 | 5525566666665533111777755555666666666666666 |
| Metal Slates "Slitting Saws." Workers' Crayons Metallic Belt Lacing. "Measuring Tapes Metalf Emery Wheel Dressers Meter Cocks, Gas, Brass Meters, Oil, Worthington. "Water, King. "Water, Niagara "Water, Niagara "Water, Worthington Metopolitan Injector Repairs Injectors Miami Glass Oil Cups Micrometer Caliper Gauges "Caliper Sets "Caliper Sets "Caliper Squares "Stands Micrometers Mill Board, Asbestos "Brooms "Dogs, Saw, Knight's Ideal "Hose, Cotton. "Picks Milled Coupling Bolts. Miller's Reversible Ratchet Stocks Milling Cutters "Key-Seating Machines "Machine Vises "Machine Vises "Machine Vises "Machine Golden's "Cotter End "Grinding "Hollow "Lath, Gang. "Saw, Band "Saw, Band "Saw, Jane Mineral Wool "Wool Covering Miners' Scales Mining Barrows Mississippi Gauge Cocks Miter Gear Bearing Ends, Conveyor "Gears "Saws, Circular, Simonds Misers, Concrete, Smith. "Concrete, X-L- All Monarch Ratchets "Vises Monarch Ratchets "Vises Monarch Ratchets "Vises Monarch Ratchets "Vises Moran Flexible Joints Morril's Saw Sets Moran Flexible Joints Morril Batting Saw Milling Cutters "Lathe Centers "Lathe Couters "Lathe Couters " | Nos, 100 (100 (100 (100 (100 (100 (100 (100 | 55555555555555555555555555555555555555 |

THE CAMERON & BARKLEY CO.

xxvii

| Page | Pag |
|--|---|
| Morse Sprocket Wheel Cutters750 | Nuts, Finished 63: " Hot Pressed 63: " Semi-Finished 63: " Thumb 61: O D Pine 9 |
| " Stocking Cutters | " Hot Pressed |
| Straight Way Drills 694, 695 Straight Way Drills 694, 695 T Slot Cutters 749 Taper Mandrels 737, 738 Taper Ratchets 518 Tape 757, 758 Twist Drills 683-693, 702-709 Mortar Barrows 274 Market Cores 274 | " Thumb |
| " Taper Mandrels | O 010 00 |
| " Tana | O. D. Pipe 218, 220 O & S Vertical Steam Engines 980 |
| " Twist Drills | Oakum 11 Obtuse Grate Bars 94 |
| Mortise Gears | Oil Black |
| Mortisers | "Cylinder |
| Motor Cars, Gasoline537 | Engine |
| " Hoists Lidgerwood 460 | Obtuse Grate Bars 94 Oil, Black 2 " Cylinder 2 Engine 2 " Machine 9 Oil Burners, Fuel 94 |
| "Cars, Inspection 537 "Hoists, Lidgerwood 460 Motors, Willey 1117, 1118 Moulders' Dry Brushes 579 | "Cans. 210, 21 "Cans, Dispensing, Factory 21 "Cup Corks 19 "Cup Glasses 19 "Cups, Brass 187, 18 |
| Moulders' Dry Brushes | " Cans, Dispensing, Factory |
| Soft Dusters 579 Spoons 576 Squares 576 Tools 574-576 | " Cup Glasses |
| Squares | " Cups, Brass |
| | " Cups, Glass 189-19 " Cups, Locomotive 18 " Cups, Rod, Automatic 19 " Cups, Rod, Champion 19 " Drills 71 " Filters, White Star 21 " Headlights 21 " Motors Worthington 16 |
| "Cutters. 1037 Mueller Pressure Regulating Valves. 124 Mule Pulley Stands, Dodge. 429 | " Cups, Rod, Automatic 19 |
| Mueller Pressure Regulating Valves | " Cups, Rod, Champion |
| Muslin Buffs | " Filters, White Star |
| Muslin Buffs | " Headlights |
| Nails, Barb | " Meters, Worthington 16 |
| " Barrel | " Pumps, Cylinder, Hand |
| " Box | "Headlights 21. "Meters, Worthington 16. "Pumping Apparatus, Fuel 94. "Pumps, Cylinder, Hand 20. "Pumps, Lunkenheimer 20. "Pumps, Mechanical 202, 20. "Pumps, Sherwood 20. "Pumps, Walkers" 21. "Separators, Austin 16. "Separators, Cochrane 16. "Twist Drills 70. |
| " Casing 639 " Cement Coated 640 " Clinch 639 | " Pumps, Sherwood |
| " Clinch | " Pumps, Walkers' |
| " Common | " Separators, Austin |
| " Fine | " Twist Drills |
| Finishing 639 Flooring 639 | Twist Drills 70 |
| " Hinge 639 | Oilers, Brass |
| Hinge 639 Roofing 603, 639 | " Jackson |
| " Shingle | Jackson 200 |
| " Slating | " Railroad |
| Wire, Steel | " Steel |
| Name Stamps, Steel 539 Namoe Cotton Presses 1133 Narrow Gauge Hand Cars 536 Nason Steam Traps 105 Navy Square Flax Packing 9 Valves, Brass 73 Needle Files 662 Needle Files 202 Needle Files 202 | Oiling Devices, Centrifugal. 19 "Devices, Crank Pin 19 "Devices, Cross Head 19 "Devices, Lunkenheimer 193, 19 |
| Narrow Gauge Hand Cars | " Devices, Crank Pin |
| Navy Square Flax Packing 9 | " Devices, Lunkenheimer |
| Valves, Brass73 | " Devices, Nugents |
| Neptune Covering 20 21 | Oily Waste Cans 21 |
| Waterproof Leather Belting25 | Devices, Lunkenheimer |
| New Easy Bolt Clippers, Porters'874 | Oliver Quick Acting Woodworkers' Vises 813 |
| Newman Patrol Boxes | One-Lock Adjustable Reamers727-72 |
| Watchman's Clocks | Oneida Pressed Steel Split Pulleys |
| Nicholson Expanding Lathe Mandrels | Orange Peel Buckets |
| Needle Files | Ore Barrows |
| Nippers, Cut | Ore Barrows |
| Nippers, Cut. 861 Cutting. 874 | " Splicing, Belt 3 |
| Nipples, Hose | Utilet Pipe, Valve, Improved |
| Nitro Glycerine | P |
| Noiseless Back Pressure Valves, Davis | Packers Rubber 101 |
| | PACKER Ratchets 52 Packers, Rubber 101 Packing, Coil, Diagonal Expansion |
| Nove High Speed Steel Flat Twist Drills | " Coil, Flax, Phosphate Brand. " Coil, Gum Core, Gilt Edge. " Coil, Ideal Piston. |
| " Tool Steel | " Coil. Ideal Piston |
| Tool Steel | |
| " Hose 56 Nugents Oiling Devices 195 | " Duck |
| Nut Lock Washers, Maileable 635 | Duck 1 |
| Locks 634 Tapping Machines, Little Giant 912, 913 | " Flax, Square, Gilt Edge |
| Tape | " Flax, Square, Standard 1 |
| Nuts, Case-Hardened 633 Cold Punched, Chamfered and Trimmed 632 | " Hemp 1" " Hot Water, Spiral, Carolina |
| Cold Function, Chamtered and Trimmed 632 | not water, Spiral, Carolina |

THE CAMERON & BARKLEY CO.

| | Page | |
|--|----------------|--|
| Packing, Jute | . 17 | Perkins Shingle Packers Peter Wright Anvils |
| " Piston | . 17 | Peter Wright Anvils |
| Piston Piston Piston, Ideal Pump, Air, Dixie Pump, Air, Hecla | . 5 | Phosphate Barrows |
| " Pump, Air, Dixie | . 10 | " Brand Flax Coil Pack |
| " Pump, Air, Hecia | . 10 | " Cars, Self-Dumping |
| " Ding High Programs Divis | 17 | " Dryers, Lombard |
| Ring. Ring, High Pressure, Dixie Ring, Hydraulic, Waterproof, Improved | . 3 | " Guns " Hose |
| " Ring, Improved | . 2 | " Mining Flanged Fittin |
| " Ring, Red Core, Helicoid | . 1 | " Pulverizers, Sturtevar |
| Ring, Improved | . 2 | Phosphor Tin |
| " Rope, Asbestos | . 17 | Pick Eye Blanks |
| Rope, Asbestos. Sheet, Cloth Insertion. Sheet, Pyroid. Sheet, Pyroid. | . 13 | Phosphor TinPick Eye Blanks |
| Sheet, Pyroid | . 14 | " Tongs |
| " Sheet Samihranga | 13 | Pick-Up Tongs |
| " Sheet White Magnolia | i 12 | Pickaroons |
| Sheet, Semibronse Sheet, White, Magnolia Shingle, Perkins | 1107 | Pickering Governors |
| " Soapstone | . 17 | Picks, Boiler |
| " Spiral, High Pressure, Dixie | . 4 | " Clay |
| "Soapstone Dixie Spiral, High Pressure, Dixie Spiral, Improved, Helicoid Spiral Red Core Helicoid | . 3 | Picks, Boiler |
| Spiral, Red Core, nelicold | . 4 | " Contractors' |
| | : 11 | " Milla |
| " Valhestine | i ii 📗 | " Mills " Ore |
| "Tucks, Square. "Valbestine. "Wick, Asbestos. | . 17 | " Peavey |
| Pails, Fire | . 62 | " Quarry |
| Pails, Fire. Paint, Asphaltum, Black. " Roof, Cameroid. | 603 | " Railroad |
| " Roof, Cameroid | . 603 | Stone |
| " Sco-co" Smokestack | . 603 | "Surface Tamping |
| | | Pig Lead |
| " Covering | 20.21 | Tin |
| " Covering | . 370 | " Tin |
| Paper, Asbestos | . 18 | Pikes, Pike Pole |
| Paper, Asbestos. Building. Emery | . 602 | Pile Bands |
| " Emery | . 672 | " Head Covers |
| " Flint | 672 | " Points |
| " Sand | 672 | Pillow Block Oiling Devices |
| Paper Frictions. Paragon Oilers. | 432 | " Blocks, Bond |
| Paragon Oilers | . 204 | " Blocks, Bond |
| " Sight Feed Lubricators | . 192 | Pin Anchor Shackles |
| Sight Feed Lubricators Parker Vises. Parmelee Pipe Wrenches Parts, Injector, Metropolitan. "Injector, Penberthy. "Injector, U.S. Patch Bolt Taps. "Bolts, Boiler. Patrol Boxes, Newman Pattern Figures | . 814 | " Reamers, Taper |
| Parmelee Pipe Wrenches | 186 | " Spanners |
| " Injector Penherthy | 177 | Pins Dowel Barbed |
| " Injector, U. S | 179 | Vises. Pins, Dowel, Barbed. Escutcheon, Brass. |
| Patch Bolt Taps | . 763 | Taper |
| " Bolts, Boiler | 622 | Pintle Chain, Closed End |
| Patrol Boxes, Newman | . 151 | Pioneer Glass Oil Cups |
| Pattern Figures. " Letters " Rules, Magic. Patternmakers' Vises. | 581 | Pioneer Glass Oil Cups. Pipe, Asphalted |
| " Rules Magic | 867 | " Cast Iron |
| Patternmakers' Vises | 815 | " Cast Iron, Specials for |
| | | " Cutting |
| " Track Drills | . 530 | " Cutting |
| " Track Drills Peabody Fuel Oil Burners Peavey Bolts " Handles | . 949 | Expansion John |
| Peavey Bolts | . 560 . 562 | Extra Strong |
| " Hooks | 560 | " Extra Strong, Double "Flanged, Cast Iron |
| " Picks | . 560 | " Galvanized |
| " Sockets | . 560 | " Gas |
| Peavies Peerless Belt Lacing Machines | . 559 | " Lead |
| Peerless Belt Lacing Machines | . 38 | " Line |
| Penberthy Ejectors. "Injector Repairs | . 184 | " Merchant |
| " Injector Repairs | 6-178 | " Outlet, Valve, Improv |
| " Jet Pumps | . 184 | " Riveted, Spiral, Amer |
| " Jet Pumps. Perfected Duplex Air Valves. Perfection Pressure Regulating Valves. " Saw Gummers and Sharpeners, At- | . 99 | " Sewer |
| Perfection Pressure Regulating Valves | . 122 | " Steam |
| " Saw Gummers and Sharpeners, At- | 1052 | " Threading |
| kinsPerforated Elevator Buckets | 1053 | water |
| " Motel | 598 | " Wrought Iron |
| " Metal | 1106 | |
| Boilers | 1107 | " Clamps, Steam, Emer |
| " Champion Drag Saw Machines | 1105 | " Clamps, Water |
| " Knot Saws | 1106 | " Coils |
| " Power Feed Bolters | 1104 | " Couplings, Wrought I |
| oningie Machines | 1109 | Covering, Sectional |

| n | Pag |
|--|----------------------|
| Perkins Shingle Packers Peter Wright Anvils Phosphate Barrows Brand Flax Coil Packing Cars, Self-Dumping Dryers, Lombard Guns Hose | 110 |
| Phosphate Barrows | 48 |
| " Brand Flax Coil Packing | |
| " Cars, Self-Dumping | 479 |
| " Guns | 112 |
| " Hose | 5 |
| " Mining Flanged Fittings | . 23 |
| "Guns "Hose "Mining Flanged Fittings "Pulverizers, Sturtevant 11: Phosphor Tin Pick Eye Blanks "Handles "Mattocks "Tongs Pick-Up Tongs Pickaroons. Pickering Governors Picks, Boiler "Clay "Coal "Contractors' "Drifting "Mills | 51, 112; 51, |
| Pick Eye Blanks | 50 |
| " Handles | 51 |
| " Mattocks | 50 |
| Pick-Up Tongs | 54 |
| Pickaroons | 56 |
| Pickering Governors | 13 |
| " Clay | 504 501 |
| " Coal | 50 |
| " Contractors' | 50 |
| " Drifting | 50 |
| " Ore | 50 |
| Mills Ore Peavey Quarry Railroad | 56 |
| " Quarry | 50 |
| " Stone | 50: |
| " Surface | 50 |
| "Tamping | 50 |
| " Tin | 51 |
| " Quarry " Railroad " Stone " Surface " Tamping Pig Lead " Tin Pike Poles Pikes Pike Pole Pile Bands " Head Covers " Points " Shoes Pillow Block Oiling Devices " Blocks, Bond " Blocks, Bond " Blocks, Dodge Pin Anchor Shackles " Reamers, Taper " Spanners " Vises Pins, Dowel, Barbed " Escutcheon, Brass " Taper Pintle Chain, Closed End Pioneer Glass Oil Cups Pipe, Asphalted " Black " Cast Iron. " Cast Iron. " Cast Iron. " Cutting " Drive | 56 |
| Pikes, Pike Pole | 56 |
| Pile Bands | 17 |
| " Points | 47 |
| " Shoes | 47 |
| Pillow Block Oiling Devices | 19 |
| " Blocks, Bond | 122, 42 117 41 |
| Pin Anchor Shackles | 56 |
| " Reamers, Taper | 71 |
| " Spanners | 79 |
| Pins. Dowel. Barbed | 63 |
| " Escutcheon, Brass | 64 |
| " Taper | 64 |
| Pintle Chain, Closed End | 33 18 |
| Pipe, Asphalted | 219. 22 |
| " Black | 219, 22 |
| " Cast Iron Specials for | 23 |
| " Cutting | 22 |
| " Drive | . 22 |
| " Expansion Joint | 23 |
| " Cast Iron, Specials for | 218, 22 218, 29 |
| " Flanged, Cast Iron | 23 |
| " Galvanized | 219, 22 |
| " Gas | 219, 22 |
| " Line | $1 \cdot 1 \cdot 22$ |
| Line Merchant O. D Outlet, Valve, Improved Riveted, Spiral, American Sewer Steam Threading | 21 |
| " O. D | 218, 22 |
| " Cutlet, Valve, Improved" " Riveted, Spiral, American | 100 99 |
| " Sewer | 238, 23 |
| " Steam | 219, 22 |
| Threading | 22 |
| " Wrought Iron | 218-22 |
| " Wrought Steel | 218-22 |
| " Steam "Threading "Water "Wrought Iron "Wrought Steel Pipe Bends "Clamps, Steam, Emergency "Clamps, Water "Coils "Couplings, Wrought Iron "Covering, Sectional " | 22 |
| " Clamps, Steam, Emergency, | 27 27 |
| " Coils | 22 |
| Couplings, Wrought Iron | 24 |
| Covering, Sectional | 20, 2 |

| | | Page | Page |
|--------------|--|---------------------|--|
| Pipe | Cutters | | Plates, Floor, Cast Iron |
| ** | Cutters, Barnes | 800 | " Hook, Cast Iron |
| ** | Cutters, Saunders | 800 | " Hook, Expansion |
| •• | Cutters, Soil | 801 | "Hook, Expansion 309 "Hook, Steel 309 "Screw, Little Giant 781-783 |
| •• | Cutters, Stanwood Cutters, Trimo Cutters, Vosper Cutting Machines, Armstrong | 800 | Platform Scales, Counter |
| 41 | Cutters. Vosper | 800 | " Scries. Portable |
| •• | Cutting Machines, Armstrong. | 806, 807 | Platt's Cotton Gins |
| •• | | | Pliers, Burner 873 " Combination 873 |
| •• | Fittings, Sewer Flanged Fittings, Riveted, Spiral Flanges, Riveted, Spiral | 238, 239 | " Combination 873 |
| | Flanged Fittings, Riveted, Spiral | 231 | " Cutting |
| •• | Folders | 880 | " Gas |
| ** | Hangers, Ball Joint, Hanna | 313 | " Round Nose 873 |
| •• | Hangers, Ball Joint, Hanna Hangers, Expansion Ring | 314 | " Round Nose |
| •• | Hangers, Extension | 311 | Plough Steel Hoisting Rope |
| ** | Hangers, F. and M | 312 | Plows, Grading 476 Plugs, Fusible, Marine 158 |
| •• | Hangers, Solid Ring | 311 | Plumb Pohe 960 |
| •• | Hangers, Split Ring | 313 | Plumb Bobs. |
| •• | Hangers, Steel Band | 311 | " Bobs, Steel |
| •• | Heads, Exhaust, Burt | 175 | Plumbers Levels |
| •• | Heads, Exhaust, Champion | 175 | Plunger Leathers, Pump |
| | Heads, Exhaust, Lyman Heads, Exhaust, Swartwout | 175 | Pneumatic Beading Hammers |
| | Heads, Exhaust, Swartwout | 210 | " Calking Hammers 500 " Chipping Hammers 500 |
| •• | Hooks, Gas Joint Compound, Graphite | 310 | " Hose |
| •• | Machines, Armstrong | 806, 807 | "Riveting Hammers 500 |
| •• | Machines, Jarecki | 8071 | "Tank Trimmings 1001 "Tanks, Kewanee 1000 |
| •• | Reamers | | Tanks, Kewanee |
| ••• | Saddles, Steam | 273 | Pocket Levels 863 " Rules, Steel, Folding 837 |
| •• | Stocks and Dies | 801-80ə, 808 210 | " Screw Drivers |
| | Taps | 763 | " Scribers |
| •• | Threading Machines, Forbes Pate | nt 808 | " Slide Calipers |
| •• | Tongs, Chain, Champion | 789 | " Slide Calipers 844 " Stones, Carborundum 670 |
| •• | Tongs, Chain, Champion Tongs, Chain, Trimo Tongs, Chain, Vulcan | 789 | Points, Ball |
| •• | Tonge, Chain. Vulcan | 789 | " Pile |
| •• | I PROP UNSTOMS | ZIB | " Trammel |
| •• | Vises, Combination | 810 | " Well, Drive, Brass Jacket |
| •• | Vises, Henderer | 810 | Poles, Pike |
| ** | Vines, Jarecki | 810 | Polish, Metal |
| ** | Wrenches, Brass, Hayden | 788 | Polishing Wheels |
| | Wrenches, Parmelee | 788 | Pop Safety Valves, Brass, American |
| Dina | Wrenches, Stillson | 56 | Portable Forces Ruffelo 552-554 |
| Piete | n Air Drills | 501 | " Safety Valves, Iron Body, American |
| •• | Pecking | 17 | nand Punches |
| | Packing, Ideal. Gauges, Screw. er Spout Pumps. burgh Gauge Cocks. | | " Hand Shears |
| Pitel | Gauges, Screw | 857 | " Key-Seating Machines 915 |
| nu: | burn Cause Cooks | 103 | " Platform Scales |
| ritu | Recording Pressure Gauges | 149 | " Tool Stands |
| •• | Recording Vacuum Gauges | 149 | " Vise Stands |
| •• | Safety Water Columns Steam Separators | 156 | Porter Belt Clamps |
| _" | Steam Separators | 163 | "Contractors' Locomotives 541 |
| Livo | ted Bucket Carriers | 370 | Positive Lock Washers |
| Plan | Take-Up Boxes | 779 | Post Rearings Dodge 417 |
| | er Chucks, Massey's Chucks, Skinner | 779 | Post Bearings, Dodge 417 Boxes, Bond 424 Drills, Blacksmiths', Buffalo 550, 551 Hangers, Ball and Socket, Dodge 416 Unexpected by the state of t |
| •• | Head Bolts | 615 | " Drills, Blacksmiths', Buffalo 550, 551 |
| •• | Jacks, Armstrong. Knife Grinders, Automatic | 828 | " Hangers, Ball and Socket, Dodge 416 |
| •• | Knife Grinders, Automatic | 1063 | |
| •• | Knives | 1035–1037 25 | Posts Deilling Keystons 521 |
| •• | Tools, Armstrong | 821 | " Maul Handles 511 Posts, Drilling, Keystone 521 " Indicator 96 |
| Plan | ers. American | 900 | Pots, Solder 515 |
| ** | Matchers and Moulders | 1091 |) '' Tallow 208 |
| Plan | era and Jointers | 1097 | Potter Belt Hooks 33 Powder, Contractors' 571 " Judson 571 Power Feed Bolters, Perkins 1104 |
| Plan | es, Belt, Adjustable | 36 | Powder, Contractors' |
| rish Dian | incurre, I nompson | 145 | Judson |
| •• | Mill Trucks | 491 | " Hack Saws |
| Plac | ter Board, Blue | 602 | " Pipe Machines, Armstrong 806. 807 |
| Plat | ter Board, Blue Shafting Couplings, Bond Base, Dodge | 411 | " Pipe Machines, Armstrong |
| Plat | sa, Base, Dodge | 428 | " Pumps |
| ** | Cading, Brass | 315 | Pumps, Bulldoser |
| •• | Ceiling, Cast Iron | 315 | rumps, rairbanks-Worse |
| ** | Floor, Brass | 315 | " Pumps, Fairbanks-Morse 963 " Rotary Fire Pumps, Rumsey 996 " Rotary Force Pumps, Rumsey 995 |
| | | | |



| | | | Page |
|--|--|---|---|
| Powe | r Transmission, Rope | | 378 |
| Pratt | t & Cady Brass Gate Valves | | 77 68 |
| ••• | Brass Valves | ٠ | 68 |
| _ '' | Iron Body Valves | 8 | 1,90 |
| Pren | tiss Vises | 811 | -813 |
| Press | Vises, Drill | : | 774 |
| Press | ed Steel Split Pulleys, Oneida | 396 | -398 |
| Press | es, Baling, Steam | | 1134 |
| •• | Cotton, Nance | | 1133 |
| " | Drill | 891 | -893 |
| " | Wheel, Hydraulic | | 890 |
| Press | ure Blowers, Positive | | 556 |
| •• | Blowers, Steel, Buffalo | | 557 |
| •• | Gauges | 140 | , 141 |
| •• | Gauges, Recording, Bristol | | 148 |
| " | Gauges, Recording, Pittsburgh | | 149 |
| ** | of Water Columns, Rules for Finding. | | 1139 |
| •• | Regulating Valves, Davis | | 119 |
| " | Regulating Valves, Foster | | 121 |
| •• | Regulating Valves, K and T | | 122 |
| •• | Regulating Valves, Kieley | 120 | , 125 |
| ** | Regulating Valves, Mueller | | 124 |
| ** | Regulating Valves, Perfection | | 122 |
| Press | sures, Water Working, Proportionate | | 218 |
| Pribr | now Saw Swage Shapers | | 1046 |
| Proof | f Coil Chain | | 380 |
| Prote | er Transmission, Rope. & Cady Brass Gate Valves. Brass Valves Iron Body Valves. tiss Vises. Ivises, Drill. ed Steel Split Pulleys, Oneida. es, Baling, Steam. Cotton, Nance. Drill. Wheel, Hydraulic. uure Blowers, Positive. Blowers, Positive. Blowers, Steel, Buffalo Gauges, Recording, Bristol. Gauges, Recording, Bristol. Gauges, Recording, Pittsburgh. of Water Columns, Rules for Finding. Regulating Valves, Foster Regulating Valves, Kand T. Regulating Valves, Kand T. Regulating Valves, Mueller. Regulating Valves, Mueller. Regulating Valves, Perfection. sures, Water Working, Proportionate now Saw Swage Shapers f Coil Chain. ractors. 840, Bevel. Draftsmen's. | 841 | , 845 |
| " | Bevel | | 840 |
| ** | Draftsmen's | | 845 |
| ** | Patent | | 840 |
| Pulle | Devel. Draftsmen's. Patent rs, Hand, Steam Gauge | | 104 |
| ** | Spike | | 525 |
| Pulle | y Stands, Mule, Dodge | | 429 |
| •• | Taps | | 760 |
| Pulle | vs. Flanged, Cast Iron, Dodge | | 405 |
| •• | Horse Power of | | 1138 |
| ** | Solid, Cast Iron, Dodge | 399 | 401 |
| •• | Split, Cast Iron, Dodge399. | 402 | -405 |
| ** | Split, Steel, Pressed, Oneida | 396 | -308 |
| | | | |
| | Split. Wood. Dodge | | 395 |
| " | Tight and Loose, Cast Iron, Dodge | | 395 405 |
| ** | Tight and Loose, Cast Iron, Dodge | | 395 405 1060 |
| Pulse | Spirt, Wood, Dodge. Tight and Loose, Cast Iron, Dodge. and Stands, Band Saw | | 395 405 1060 948 |
| Pulse | Split, Wood, Dodge Tight and Loose, Cast Iron, Dodge and Stands, Band Saw ometer Steam Pumps erizers. Phosphate. Sturtevant | 27. | 395 405 1060 948 1128 |
| Pulse Pulve | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge. and Stands, Band Saw. ometer Steam Pumps. erizers, Phosphate, Sturtevant | 27, | 395 405 1060 948 1128 |
| Pulso Pulvo Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge. and Stands, Band Saw. ometer Steam Pumps. erizers, Phosphate, Sturtevant | 27, 15- | 395 405 1060 948 1128 1017 |
| Pulso Pulvo Pum | Spit, Wood, Dodge. Tight and Loose, Cast Iron, Dodge. and Stands, Band Saw. meter Steam Pumps. erizers, Phosphate, Sturtevant | 27, 15- | 395 405 1060 948 1128 1017 63 |
| Pulse Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw meter Steam Pumps. erizers, Phosphate, Sturtevant | 27, 15- | 395 405 1060 948 1128 1017 63 131 |
| Pulse Pulve Pum | Spit, Wood, Dodge. Tight and Loose, Cast Iron, Dodge. and Stands, Band Saw ometer Steam Pumps. Tight and Pumps. 10 p Cylinders. 10 Diaphragms. Governors, Carr Governors, Fisher. Governors, Gardner. | 27, | 395 405 1060 948 1128 1017 63 131 131 |
| Pulse Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw. meter Steam Pumps. erizers, Phosphate, Sturtevant | 27, | 395 405 1060 948 1128 1017 63 131 131 131 |
| Pulso Pulvo Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw ometer Steam Pumps. erizers, Phosphate, Sturtevant | 27, | 395 405 1060 948 1128 1017 63 131 131 132 |
| Pulsc Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge. and Stands, Band Saw ometer Steam Pumps. 10 p Cylinders. 10 Diaphragms. Governors, Carr Governors, Fisher. Governors, Gardner Governors, Mason. Governors, S-C. Governors, Waters. | 27, | 395 405 1060 948 1128 1017 63 131 131 132 132 |
| Pulsc Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw meter Steam Pumps. erizers, Phosphate, Sturtevant | 27, | 395 405 1060 948 1128 1017 63 131 131 132 132 132 |
| Pulso Pulvo Pum | Spit, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw ometer Steam Pumps perizers, Phosphate, Sturtevant 11 p Cylinders 10 Diaphragms. 10 Diaphragms. 10 Governors, Carr Governors, Fisher Governors, Gardner Governors, Gardner Governors, S-C. Governors, Waters Governors, Waters Leather Leather | 27, | 395 405 1060 948 1128 1017 63 131 131 132 132 132 |
| Pulsc Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw meter Steam Pumps. erizers, Phosphate, Sturtevant 11 p Cylinders 10 Diaphragms 10 Governors, Carr Governors, Fisher Governors, Gardner Governors, Mason Governors, S-C Governors, S-C Governors, Waters Governors, Waters Leather Oilers | 27, | 395 405 1060 948 1128 1017 63 131 131 132 132 133 132 1012 |
| Pulsc Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw ometer Steam Pumps erizers, Phosphate, Sturtevant | 27, 15- | 395 405 1060 948 1128 1017 63 131 131 132 132 133 132 1012 205 |
| Pulse Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw ometer Steam Pumps. Prizers, Phosphate, Sturtevant | 27, | 395 405 1060 948 1128 1017 63 131 131 132 132 1012 205 |
| Pulse Pulve Pum | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Fisher Governors, Gardner Governors, Mason Governors, Sec Governors, Waters Governors, Waters Governors, Waters Governors, Waters Heather Oilers Packing, Air, Dixie Packing, Air, Dixie Packing, Air, Desage August 1900 August 19 | 27, 115 | 395 405 1060 948 1128 1017 63 131 131 132 132 1012 205 10 1012 |
| Pulse Pulve Pum | Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw ometer Steam Pumps. erizers, Phosphate, Sturtevant | 27, | 395 405 1060 948 1128 1017 63 131 131 132 132 132 1012 205 10 101 101 1141 |
| Pulse Pulve Pum | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Fisher Governors, Gardner Governors, Mason Governors, Sec Governors, Sec Governors, Waters Governors, Waters Covernors, Waters Governors, Waters Covernors, Covernors Covernors, Covernors | 27, | 395 405 1060 948 1128 1012 131 131 132 132 132 1012 205 10 10 1014 11011 |
| Pulsc Pulve Pum | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Fisher Governors, Gardner Governors, Gardner Governors, Wason Governors, Wason Governors, Waters Governors, Waters Governors, Tisher Governors, Mason Covernors, Waters Governors, Waters Governors, Waters Formaliser Covernors, Waters Covernors, Covernors Cov | 27, 15 | 395 405 1060 948 1128 1017 63 131 131 132 132 1012 100 10 101 1011 1141 1011 |
| Pulsc Pulv Pum | Split, Wood, Dodge and Stands, Band Saw Tight and Loose, Cast Iron, Dodge and Stands, Band Saw prizers, Phosphate, Sturtevant 11 p Cylinders 10 Diaphragms Governors, Carr Governors, Fisher. Governors, Gardner. Governors, Mason Governors, S-C. Governors, S-C. Governors, Waters Governors, Waters Leather Oilers Packing, Air, Dixie Packing, Air, Dixie Packing, Air, Hecla Plunger Leathers Problems, Formulae for Calculating. Rod, Steel. Rod Couplings Rtandards Force | 27, 15- | 395 405 1060 948 11128 1017 63 131 131 132 132 1012 205 10 10 10 10 11 11 11 11 11 11 11 11 11 |
| Pulsc Pulv Pum | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Fisher Governors, Gardner Governors, Gardner Governors, Watson Governors, Watson Leather Leathers Packing, Air, Dixie Packing, Air, Dixie Packing, Air, Hecla Plunger Leathers Problems, Formulae for Calculating Rod Couplings Standards, Force Valve Leathers Standards, Force Valve Leathers Standards | 27, 15- | 395 405 1060 948 11288 1017 63 131 131 132 132 205 10 10 10 10 1141 1011 1011 1983 |
| Pulsc Pulv Pum | Split, Wood, Dodge and Stands, Band Saw Tight and Loose, Cast Iron, Dodge and Stands, Band Saw | 27, 115 | 395 405 1060 948 1128 1128 1131 131 131 132 132 1012 205 10 10 10 10 1141 1101 1101 983 1012 64 |
| Pulso Pulv Pulv | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Fisher Governors, Gardner Governors, Mason Governors, Ser Governors, Waters Governors, Waters Governors, Waters Covernors, Waters Packing, Air, Dixie Packing, Air, Dixie Packing, Air, Hecla Plunger Leathers Problems, Formulae for Calculating Rod Steel Rod Couplings Standards, Force Valve Leathers Valves, Rubber Noing Angastus, Fuel Oil | 27, 115 | 395 405 1060 948 1128 1017 63 131 131 132 132 205 10 10 10 10 11 10 11 983 10 12 64 64 64 64 64 |
| Pulsv Pulsv Pum | Split, Wood, Dodge. Split, Wood, Dodge. and Stands, Band Saw. meter Steam Pumps. erizers, Phosphate, Sturtevant | 27, 115 | 395 405 1060 948 1128 1017 63 131 131 132 132 1012 205 10 1012 1141 1011 983 1012 64 9100 |
| Pulsk Pulvv Pum | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Fisher Governors, Gardner Governors, Mason Governors, Sec Governors, Waters Governors, Waters Governors, Waters Covernors, Waters Coverno | 27, 115 | 395 405 1060 948 1128 1017 63 131 131 132 132 1012 205 10 10 10 10 11 11 11 1011 11 983 31 1012 64 949 11 1011 1011 |
| Pulsky Pum | Split, Wood, Dodge. Split, Wood, Dodge. and Stands, Band Saw. Dight and Loose, Cast Iron, Dodge. and Stands, Band Saw. Dierizers, Phosphate, Sturtevant | 27, 115 | 395 405 1060 948 1128 1017 63 131 131 132 132 103 101 101 101 101 101 101 101 101 101 |
| Pulsky Purm | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant | 27, 15– | 395 405 1060 948 1128 1017 63 131 131 131 132 132 132 102 100 101 101 101 1101 1 |
| Pulse Pulve Pum | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps. erizers, Phosphate, Sturtevant 11 p Cylinders 10 Diaphragms 10 Diaphragms 10 Governors, Carr Governors, Fisher Governors, Gardner Governors, Mason Governors, Secundary Governors, Waters Governors, Waters Governors, Waters Governors, Waters Governors, Waters Governors, Waters Covernors, Waters Heather Oilers Packing, Air, Dixie Packing, Air, Dixie Packing, Air, Hecla Plunger Leathers Problems, Formulae for Calculating Rod, Steel Rod Couplings Standards, Force Valve Leathers Valves, Rubber ping Apparatus, Fuel Oil ps, Air Centrifugal Cistern Suction Fire, Fairbanks-Morse Force, Double Acting | 27, 15– 966 | 395 405 1060 948 11128 1017 63 131 131 131 132 132 1012 205 100 101 1011 1011 1011 1011 983 1012 64 949 1001 986 9,954 |
| Pulsk Pulvi Pum | Split, Wood, Dodge and Stands, Band Saw Tight and Loose, Cast Iron, Dodge and Stands, Band Saw Diaphragms Governors, Carr Governors, Carr Governors, Gardner Governors, Gardner Governors, Mason Governors, Waters Governors, Waters Governors, Waters Heather Covernors, Waters Governors, Waters Covernors, Waters Covernors | 27, 15– 966 953 985 982 | 395 405 1060 948 1128 1017 63 131 131 131 132 132 1012 205 101 1011 1011 1011 1011 983 1012 949 1001 949 949 1001 986 986 986 |
| Pulsky Purm | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps. erizers, Phosphate, Sturtevant | 27, 15- 966 953 9853 9853 987 | 395 405 1060 948 11128 11017 63 131 131 131 132 1012 205 10 10 10 1141 11011 1011 1011 1011 10 |
| Pulsk | Split, Wood, Dodge. Split, Wood, Dodge. and Stands, Band Saw. Dight and Loose, Cast Iron, Dodge. and Stands, Band Saw. Dieter Steam Pumps. Dieters. Diaphragms. Governors, Carr. Governors, Fisher. Governors, Gardner. Governors, Gardner. Governors, Wason. Governors, Waters. Governors, Waters. Governors, Waters. Packing, Air, Dixie. Packing, Air, Dixie. Packing, Air, Hecla. Plunger Leathers. Problems, Formulae for Calculating. Rod Couplings Standards, Force. Valve Leathers. Valve Leathers. Valve Leathers. Valve Leathers. Centrifugal Cistern Suction. Fire, Fairbanks-Morse Force, Double Acting Force, Hand. Force, House. Force, Russey. | 27, 15- 966 983, 983, 987, 983, | 395 405 1060 948 1128 1017 63 131 131 132 132 205 101 122 205 101 101 101 1141 1011 983 101 102 104 949 100 100 100 100 100 100 100 100 100 10 |
| Pulse Pulve | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant. 11 p Cylinders. 10 Diaphragms. 10 Diaphragms. 10 Diaphragms. 10 Governors, Carr Governors, Fisher. Governors, Gardner. Governors, Mason Governors, Sec. Governors, Waters Governors, Waters Governors, Waters Covernors, Waters Packing, Air, Dixie Packing, Air, Hecla Plunger Leathers Problems, Formulae for Calculating. Rod, Steel Rod Couplings Standards, Force Valve Leathers Valves, Rubber ping Apparatus, Fuel Oil ps, Air Centrifugal Cistern Suction. Fire, Fairbanks-Morse Force, Double Acting Force, House Force, House Force, House Force, Romsoy Force | 27, 115 | 395 405 1060 948 11128 1017 63 131 131 132 205 101 101 101 101 101 101 983 101 101 949 1001 949 949 949 986 986 988 988 988 988 |
| Pulske Pulve | Split, Wood, Dodge and Stands, Band Saw ometer Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Fisher Governors, Gardner Governors, Gardner Governors, Mason Governors, Ser Governors, Waters Governors, Waters Governors, Waters However Governors, Waters Governors, Waters Governors, Waters Governors, Waters However Governors Heather Dilers Packing, Air, Dixie Packing, Air, Dixie Packing, Air, Heela Plunger Leathers Problems, Formulae for Calculating Rod, Steel Rod Couplings Standards, Force Valve Leathers Valves, Rubber ping Apparatus, Fuel Oil ps, Air Centrifugal Cistern Suction Fire, Fairbanks-Morse Force, Double Acting Force, Hand Force, House Force, Humsey 990, Force, Thresher Let Blakeslee | 27, 15 | 395 405 1060 948 11128 11128 131 131 132 132 133 132 205 101 101 101 101 1101 1101 1101 110 |
| Pulsk Pulve | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps metres, Phosphate, Sturtevant 11 p Cylinders 10 Diaphragms 10 Diaphragms 10 Diaphragms 10 Diaphragms 10 Governors, Carr Governors, Gardner Governors, Gardner Governors, Mason Governors, Mason Governors, Waters Governors, Waters Governors, Waters However Governors, Waters Governors, Waters Packing, Air, Dixie Packing, Air, Dixie Packing, Air, Hecla Plunger Leathers Problems, Formulae for Calculating Rod, Steel Rod Couplings Standards, Force Valve Leathers Valves, Rubber ping Apparatus, Fuel Oil ps, Air Centrifugal Cistern Suction Fire, Fairbanks-Morse Force, Hand Force, Hand Force, Hand Force, Hand Force, Hand Force, Hussey 990, Force, Thresher Let, Blakeslee Let Penberthy | 27, 115 | 395 405 948 1128 1128 11131 131 131 132 133 131 132 1012 205 1012 205 1012 1011 1011 1011 |
| Pulsce Pulve Pum | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps. erizers, Phosphate, Sturtevant | 27, 15- 966 953 985, 987, 995 | 395 405 1060 948 11288 1017 63 131 131 132 133 132 101 205 101 101 101 101 101 101 101 101 101 1 |
| Pulsk Pulve | Split, Wood, Dodge and Stands, Band Saw mometer Steam Pumps erizers, Phosphate, Sturtevant | 27, 15- 966 953 985, 987, 905 | 395 405 1060 1948 1128 1128 131 131 131 131 132 133 131 132 1012 205 101 12 101 101 1141 1101 1101 1101 983 1012 984 985 185 985 185 986 985 185 986 986 987 988 988 988 988 988 988 988 988 988 |
| Pulske | Split, Wood, Dodge and Stands, Band Saw meter Steam Pumps erizers, Phosphate, Sturtevant Diaphragms Governors, Carr Governors, Gardner Governors, Gardner Governors, Mason Governors, Sec Governors, Sec Governors, Waters Governors, Finder Governors, Waters Force, Plunger Force, Valve Leathers Valves, Rubber ping Apparatus, Fuel Oil ps, Air Centrifugal Cistern Suction Fire, Fairbanks-Morse Force, House Force, House Force, Hunsey Force, Thresher Jet, Blakeslee Jet, Penberthy Lift Lift, House Oil Culinder Hand | 27, 15- | 395 405 1060 948 1128 1128 131 131 131 132 133 132 1012 205 1012 1011 1011 1098 31 1011 1011 1011 1098 988 988 988 988 988 988 988 988 988 |
| Pulsk Pulv Pum | Split, Wood, Dodge. Split, Wood, Dodge. and Stands, Band Saw. Dight and Loose, Cast Iron, Dodge. and Stands, Band Saw. Dieter Steam Pumps. erizers, Phosphate, Sturtevant | 27, 115— 966 953 985, 987, 9983, | 395 405 948 11060 948 1128 1128 131 131 131 131 132 101 2205 100 101 101 111 110 111 101 110 111 101 110 111 949 986 986 988 189 986 189 189 189 189 189 189 189 189 189 189 |
| Pulsk Pulve | Draftsmen's. Patent. re, Hand, Steam Gauge Spike. spike. spike. spike. Spike. Taps sys Stands, Mule, Dodge Taps sys, Flanged, Cast Iron, Dodge Horse Power of Solid, Cast Iron, Dodge. Split, Cast Iron, Dodge. Split, Steel, Pressed, Oneida Split, Wood, Dodge. Tight and Loose, Cast Iron, Dodge and Stands, Band Saw smeter Steam Pumps. erizers, Phosphate, Sturtevant. Diaphragms. 10 Diaphragms. 10 Covernors, Carr Governors, Gardner Governors, Gardner Governors, Mason. Governors, Mason. Governors, Mason. Governors, Wates Governors, Wates Governors, Wates Governors, Wates Covernors, Spike Packing, Air, Dixie | 27, 15- 966 953 985, 983, 983, 9983, | 395 405 1060 948 1128 1121 63 131 131 131 132 132 205 101 101 101 101 101 101 101 101 101 983 986 986 986 985 185 984 987 984 987 120 120 120 120 120 120 120 120 120 120 |

| | | 1 |
|--------------------------|---|-------------|
| Pum | ops, Oil, Sherwood. Oil, Walkers' | |
| | Oil, Walkers' Pitcher Spout | |
| ** | Power Spout | 15 0 |
| " | Power, Bulldoger | |
| ** | Power, Fairbanks-Morse | |
| ** | Set Length | 983 |
| | Steam, Emerson | ài |
| " | Steam Knowles | 350 |
| " | Steam, Pulsometer | |
| ** | Suction, Contractors' | |
| ** | Suction, Diaphragm | |
| ** | Tank, Fairbanks-Morse | 900 201 |
| | Vacuum Fairbanks-Morse | , o i |
| Pun | ches, Belt | |
| ** | Blacksmiths' | |
| | Buffalo | |
| | Hand Portable | |
| = " | Hand, Round | |
| | Hydraulic Head | |
| E | Metal, Hand, Whitney | |
| I :: | Rail, Hydraulic | |
| ** | Track Dailroad | ٠., |
| Pun | ches and Shears, Combined548. | 886 |
| - ";; | and Shears, Combined, Buffalo | |
| Puri | fiers, Feed Water, Hoppes' | 172 |
| Push | Cars | • • |
| Pust | ners, Car | • • • |
| Pyro | oid Sheet Packing | • • • |
| Pyro | ometer Gauges | |
| | ches and Shears, Combined. 548, and Shears, Combined, Buffalo. fiers, Feed Water, Hoppes | |
| QUA | ARRY Picks | ٠. |
| Onic | eh of the South Grinding Wills | • • |
| 441 | Action Drill Vises, Armstrong | ٠. |
| | | |
| ** | Opening Gate Valves, Brass | • |
| ** | Opening Gate Valves, Brass Opening Gate Valves, Iron Body, Sta | nd |
| | ARRY Picks en of the South Grinding Mills ck Acting Woodworkers' Vises, Oliver Action Drill Vises, Armstrong Opening Gate Valves, Brass Opening Gate Valves, Iron Body, Sta | |
| | | |
| | | |
| | | |
| | | |
| | | |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | XXS, Hose, Swinging ial Drills, American iator Air Valves iators, American ing Chains Dogs, Chain | 89 |
| Rad Rad Rad Rad | | 89 |

| Page | |
|--|--|
| Page Page Page Steel, Weight per Mile 638 Railway Track Scales 499 499 Rams, Hydraulic 997 Randall Graphite Sheet Lubricator 24 Rasps 655, 656, 659 Ratchet Attachments 437 Jacks, Barrett 437 Jacks, Duff 439, 440 3 Jacks, Norton 438 Sleeves 518, 520 Stocket Wrenches, Keystone 519, 521 Sockets 520 Stockets 520 Stockets 520 Twist Drills 693 Twist Drills 693 788 693 788 788 789 | Regulating Valves, Pressure, Foster |
| Railway Track Scales 499 | " Valves, Pressure, K and T " Valves Pressure Kieley |
| Rams, Hydraulic 997 | "Valves, Pressure, Kieley" Valves, Pressure, Mueller "Valves, Pressure, Perfection |
| Randall Graphite Sheet Lubricator | Valves, Pressure, Perfection |
| Ratchet Attachments | Regulator Diaphragms, Steam Regulators, Compound, Waters Reliance Safety Water Columns |
| " Jacks, Barrett 437 | Reliance Safety Water Columns |
| " Jacks, Duff | Relief Valves Cylinder Brass Amer |
| " Sleeves | "Steam Traps |
| " Socket Wrenches, Keystone519, 521 | " Valves, Hydraulic, American. |
| " Stocks, Reversible, Miller's 804 | "Valves, Hydraulic, American "Valves, Water, Brass "Valves, Water, Iron Body Renewo Brass Valves, Lunkenheime Renewo Brass Valves, Lunkenheime |
| " Tap Wrenches, Keystone | Renewo Brass Valves, Lunkenheime Renshaw Double Acting Ratchets |
| " Twist Drills. 693 Ratchets, Boilermakers'. 518, 520 " Double Acting, Renshaw. 522 | |
| Double Acting, Renshaw | Repair Links |
| " Monarch 518 " Morse Taper 518 | Injector, Penberthy Injector, U. S. "Tool, Lumbering Replacers, Car |
| Packer 520 | " Tool, Lumbering |
| " Scuare Sleeve 518 | Replacers, Car |
| " Track, Railroad, Giant 521 | Engine Resaw Machines, Patent Sharpeners, Band, Automatic |
| " Morse Taper 518 " Packer 520 " Reversible, Keystone 518, 519 " Square Sleeve 518 " Track, Railroad, Giant 521 Universal, Armstrong 522 Rasor Hones, Carborundum 669 Ready Prepared Roofing 602 " Roofing Comproid 601 | " Sharpeners, Band, Automatic. |
| Ready Prepared Roofing | Stretchers Resawing Saws, Simonds Reseating Machines, Valve, Dexter. |
| " Roofing, Cameroid | Reseating Machines, Valve, Dexter. |
| " Holders, Armstrong 828 | Return Rollers, Standard Reversible Piston Air Drills, Little C |
| Ready Prepared Rooning 002 Roofing Cameroid 601 Reamer Arbors 735, 736 Holders, Armstrong 828 Wrenches 714, 785 Reamers, Adjustable 714 "Adjustable, One-Lock 727 Bit Stock 716 Bridger 790, 721 | Reversible Piston Air Drills, Little C "Ratchet Stocks, Miller's |
| " Adjustable | |
| " Bit Stock | Revolving Screens, Champion |
| " Bridge | Ribbed Compression Shafting Coupli |
| " Center | Ratchets, Reystone Revolution Counters Revolving Screens, Champion Ribbed Compression Shafting Coupli Ridge Cap, Roll Coping, Metal Riffers Rent |
| " Center, Lightning | Rife Hydraulic Rams |
| " Chucking, Rose | Dight Angle Common Drive |
| Bit Stock 716 | "Angle Cransmission Couplings Rigid Pillow Blocks, Bond "Ring Oiling Post Boxes, Bond |
| " Jobbers' | "Ring Oiling Post Boxes, Bond |
| " Locomotive, Taper | Rigs, Drive, Conveyor. Drive, Conveyor, Sawdust. |
| " Pipe | " Drive, Live Roll |
| " Shell | Ring Dogs |
| " Taper, Finishing | "Oiling Hangers, Bond Patent. "Oiling Pillow Blocks, Bond "Oiling Pillow Blocks, Dodge |
| " Taper, Lightning | Oiling Pillow Blocks, Dodge. |
| Recessed Couplings, Wrought Iron 243 | " Oiling Post Hangers Bond |
| Recessed Couplings, Wrought Iron 243 Recording Pressure Gauges, Bristol 148 Pressure Gauges, Pittsburgh 149 | " Packing |
| " Thermometers, Bristol | " Packing. " Packing, High Pressure, Dixie. " Packing, Hydraulic, Waterproced. " Packing, Improved. |
| " Vacuum Gauges, Bristol | ed. |
| Red Core Ring Packing Helicoid 1 | " Packing, Improved |
| Red Core Ring Packing, Helicoid 1 " Core Spiral Packing, Helicoid 4 | " Packing, Sectional, Improved. |
| " Reflecting Gauge Glasses 157 | Packing, Red Core, Helicoid Packing, Sectional, Improved. Rings, Toe Rip Saw Sharpeners, Automatic |
| **Core Spiral Facking, Helicold 4 **Lead 22 **Reflecting Gauge Glasses 157 **Sheet Packing, Aurora 12 **Tubular Gaskets, Ideal 14 **Reducers, Hose 54, 55 **Reducing Companion Flanges, Extra Heavy 304 **Core Paris Flanges Standard 999 **Core Paris Flanges Standard 999 **Core Paris Flanges Standard 999 **Core Paris Flanges Standard 999 **Core Paris Flanges Standard 999 **Core Paris Flanges Standard 999 **Core Paris Flanges Standard 999 **Core Paris Flanges 500 **Core Paris 500 **Core Paris | Jaws |
| " Tubular Gaskets, Ideal | Ripping Tables |
| Reducing Companion Flanges, Extra Heavy304 | Rivet Forges |
| " Companion Flanges, Standard | " Tongs |
| " Valves, Davis | " Pipe, Spiral, American |
| " Valves, Fisher | " Pipe, Spiral, American. " Pipe Flanged Fittings, Spiral. " Pipe Flanges Spiral. |
| " Valves, Root | "Pipe Flances, Spiral. "Pipe Flances, Spiral. "Sawdust Chain. "Sawdust Chain Sprocket Whee |
| " Valves, Watson | " Sawdust Chain Sprocket Whee |
| Reels, Hose | " Hammers Preumatic |
| Hose, Swinging | Rivets |
| Refuse Conveyors | " Coopers' |
| " Companion Flanges, Standard 292 " Railing Fittings 256 " Valves, Davis 119 " Valves, Davis 119 " Valves, Fisher 123 " Valves, Mason 123 " Valves, Root 121 " Valves, Watson 124, 126 Reed's Combination Pipe Vises 810 Reels, Hose 59 " Hose, Swinging 58 Reflecting Gauge Glasses, Red 157 Refuse Conveyors 1084 Regrinding Brass Blow-Off Valves 109 " Brass Valves, Lunkenheimer 69, 71 | I Hame |
| Brass Valves, Lunkenheimer | " Structural |
| Paralatina Values Promuse Davis 110 | " and Dume Comme |

| D 145 771 D D : | |
|--|--|
| Regulating Valves, Pressure, Foster | 121 |
| " Valves, Pressure, K and T | 122 |
| " Valves, Pressure, Kieley | 120, 125 |
| " Valves, Pressure, Mueller | 124 |
| " Valves, Pressure, Perfection | 122 |
| Regulator Dianheaging Steam | 63 |
| Deculators Compound Waters | 122 |
| Regulators, Compound, Waters | 100 |
| Reliance Safety Water Columns | 155 |
| Steam Traps | . 164 |
| Relief Valves, Cylinder, Brass, American | 115 |
| " Valves, Exhaust, Crane | 130 |
| " Valves Hydraulic American | 116 |
| " Valvos Water Drage | 117 110 |
| Walter Water Drass | |
| valves, water, from Body | |
| Renewo Brass Valves, Lunkenheimer | 70 |
| Renshaw Double Acting Ratchets | 522 |
| Repair Links | 565 |
| Renairs Injector Metropolitan | 180 |
| " Injector Depharthy | 177 |
| th Tailean Ti C | 177 |
| injector, U.S | 179 |
| Tool, Lumbering | 560 |
| Replacers, Car | 524, 525 |
| " Engine | 524 |
| Resaw Machines, Patent | 1114 |
| " Sharpeners Rand Automatic | 1054 |
| " Circiolom | 1077 |
| Describe Comp Cine 1 | |
| nesawing baws, bimonds | 1028 |
| Reseating Machines, Valve, Dexter | 876 |
| Return Rollers, Standard | 349 |
| Reversible Piston Air Drills, Little Giant | 501 |
| " Ratchet Stocks Miller's | 804 |
| " Ratcheta Kayetone | 518 510 |
| Pavalution Counters | 140 |
| Devolution Counters | 140 |
| Revolving Screens, Champion | 480 |
| Ribbed Compression Sharting Couplings, | Bond . 411 |
| Ridge Cap, Roll | 605 |
| " Coping, Metal | 607 |
| Rife Hydraulic Rams | 997 |
| Rifflers, Bent | 662 |
| Right Angle Conveyor Drive | 350 |
| H. Andle Theorem Continue At | |
| | |
| Digid Dillog Please Dond | nond430 |
| Rigid Pillow Bisson Couplings, Air | nond430 |
| Rigid Pillow Blocks, Bond | nond430 425 424 |
| Rigid Pillow Blocks, Bond | nond430 425 424 1084 |
| Rigid Pillow Blocks, Bond. " Ring Oiling Post Boxes, Bond. Rigs, Drive, Conveyor, Sawdust | nond430 425 1084 1086 |
| Rigid Pillow Blocks, Bond. Rigid Pillow Blocks, Bond. Rigs, Drive, Conveyor. Drive, Conveyor, Sawdust. Drive, Live Roll. | nond430 425 1084 1086 1080 |
| Rigid Pillow Blocks, Bond. " Ring Oiling Post Boxes, Bond. Rigs, Drive, Conveyor. " Drive, Conveyor, Sawdust. " Drive, Live Roll. Ring Dogs. | nond430 425 1084 1086, 1087 1080 |
| Angie Transmission Coupings, Air Rigid Pillow Blocks, Bond "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust "Drive, Live Roll Ring Dogs "Oiling Hangers, Bond Patent | nond430 425 1084 1086 1080 564 419 -421 |
| Rigid Pillow Blocks, Bond. " Ring Oiling Post Boxes, Bond. " Brive, Conveyor. " Drive, Conveyor, Sawdust. " Drive, Live Roll. Ring Dogs. " Oiling Hangers, Bond Patent. " Oiling Pillow Blocks, Bond. | nond 430 424 1084 1086, 1087 1080 564 419 -421 422 425 |
| Angie Fransmission Couplings, Air Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond. "Brive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Hangers, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodgs. | nond430 424 1084 1086, 1087 1080 564 419-421 422, 425 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond. "Brive, Conveyor, Sawdust. "Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Hangers, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. | nond |
| Angie Pransmission Couplings, Air Rigid Pillow Blocks, Bond. " Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor. " Drive, Conveyor, Sawdust. " Drive, Live Roll. Ring Dogs. " Oiling Hangers, Bond Patent. " Oiling Pillow Blocks, Bond. " Oiling Pillow Blocks, Dodge. " Oiling Post Boxes, Bond. | nond . 430 425 424 1084 1086, 1087 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Plangers, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. | nond . 430 . 425 . 424 . 1086, 1087 . 1080 . 564 . 419 -421 . 422, 425 . 418 . 424 |
| Rigid Pillow Blocks, Bond. " Ring Oiling Post Boxes, Bond. " Ring Oiling Post Boxes, Bond. Rigs, Drive, Conveyor. " Drive, Conveyor, Sawdust. " Drive, Live Roll. Ring Dogs. " Oiling Hangers, Bond Patent. " Oiling Pillow Blocks, Bond. " Oiling Pillow Blocks, Dodge. " Oiling Post Boxes, Bond. " Oiling Post Hangers, Bond. " Oiling Post Hangers, Bond. " Packing. | nond . 430 . 425 . 424 . 1086, 1087 . 1080 . 564 . 419 - 421 . 422, 425 . 418 . 424 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Oiling Post Hangers, Bond. "Packing. "Packing, High Pressure, Dixie. | nond . 430 . 425 . 424 1084, 1087 1080 . 564 . 419 - 421 . 422, 425 . 424 . 424 . 427 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond. Rigs, Drive, Conveyor. Drive, Conveyor, Sawdust. Drive, Live Roll. Ring Dogs. "Oiling Hangers, Bond Patent. Oiling Pillow Blocks, Bond. Oiling Pillow Blocks, Dodge. Oiling Pillow Blocks, Dodge. Oiling Post Boxes, Bond. Oiling Post Hangers, Bond. Packing. Packing, High Pressure, Dixie. Packing, Hydraulic, Waterproof, It | nond. 430 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, Inc. | nond . 430 . 425 . 424 1086, 1087 . 1080 . 564 . 419-421 . 422, 425 . 418 . 424 . 427 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, Inc. "Packing, Improved. | nond .430 .425 .424 .1084 .1086, 1087 .1080 .564 .419 -421 .422, 425 .418 .424 .424 .17 .mprov- |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Hangers, Bond. Packing, High Pressure, Dixie. Packing, High Pressure, Dixie. Packing, Hydraulic, Waterproof, Ired. Packing, Improved. Packing, Improved. Packing, Hed Core, Helicoid. | nond . 430 425 |
| Regulating Valves, Pressure, Foster Valves, Pressure, K and T Valves, Pressure, Kieley Valves, Pressure, Mueller Valves, Pressure, Mueller Valves, Pressure, Mueller Valves, Pressure, Mueller Valves, Pressure, Perfection Regulator Diaphragms, Steam Regulators, Compound, Waters. Reliance Safety Water Columns Steam Traps Relief Valves, Cylinder, Brass, American Valves, Exhaust, Crane Valves, Exhaust, Crane Valves, Water, Brass Valves, Water, Brass Renew Brass Valves, Lunkenheimer Renshaw Double Acting Ratchets Repair Links Repair Links Repair, Injector, Metropolitan Injector, Penberthy Injector, U.S Tool, Lumbering Replacers, Car Engine Resaw Machines, Patent Sharpeners, Band, Automatic Stretchers Resawing Saws, Simonds Reseating Machines, Valve, Dexter Return Rollers, Standard Reversible Piston Air Drills, Little Gian Ratchet Stocks, Miller's Ratchets, Keystone Revolution Counters Revolving Screens, Champion Ribbed Compression Shafting Couplings, Ridge Cap, Roll Coping, Metal Rife Hydraulic Rams Rifflers, Bent Right Angle Conveyor Drive Angle Transmission Couplings, Alr Rigid Pillow Blocks, Bond Ring Oiling Post Boxes, Bond Ring Dogs Oiling Hangers, Bond Patent Oiling Pillow Blocks, Bond Oiling Post Boxes, Bond Oiling Post Boxes | nond .430 .425 .424 .1084 .1086, 1087 .564 .419 -421 .422, 425 .418 .424 .422 .17 .11 mprov- |
| Angie Pransmission Coupings, Air Rigid Pillow Blocks, Bond. " Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor. " Drive, Conveyor, Sawdust. " Drive, Live Roll. Ring Dogs. " Oiling Hangers, Bond Patent. " Oiling Pillow Blocks, Bond. " Oiling Pillow Blocks, Dodge. " Oiling Post Boxes, Bond. " Oiling Post Boxes, Bond. " Oiling Post Hangers, Bond. " Packing. " Packing, High Pressure, Dixie. " Packing, Hydraulic, Waterproof, It ed. " Packing, Improved. " Packing, Red Core, Helicoid. " Packing, Sectional, Improved. | nond . 430 425 424 1084, 1087 1080, 564 419 - 421 422, 425 424 422 17 mprov- |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond. "Bring Oiling Post Boxes, Bond. "Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, I. ed. "Packing, Improved. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. | nond. 4300 425 424 1084, 1087 1080, 564 419-421 422, 425 417 1080 1080 1080 1080 1080 1080 1080 10 |
| Angie Pransmission Couplings, Air Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor. "Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Hangers, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, Improved. "Packing, Improved. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rings, Somarpeners, Automatic. | nond 430 430 424 424 1084 1086, 1087 1086 564 419-421 422, 425 417 1 mprov- 2 500 1054 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, I. ed. "Packing, Improved. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. | mond. 430 425 424 428 428 4086, 1087 1086 504 419 429 422 422 422 427 427 428 428 429 429 429 429 429 429 420 420 420 420 420 420 420 420 420 420 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond. Rigs, Drive, Conveyor. Drive, Conveyor, Sawdust. Drive, Live Roll. Ring Dogs. "Oiling Hangers, Bond Patent. Oiling Pillow Blocks, Bond. Oiling Pillow Blocks, Dodge. Oiling Post Boxes, Bond. Oiling Post Hangers, Bond. Packing. Packing, High Pressure, Dixie. Packing, Hydraulic, Waterproof, I. cd. Packing, Red Core, Helicoid. Packing, Red Core, Helicoid. Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. Saws. Ripping Tables. | mond .430 .430 .422 .422 .1084 .1086, 1087 .1086 .504 .419 -421 .422, 425 .17 .mprov2 .2 .2 .500 .1054 .1054 .1054 .1075 .1075 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing. "Packing, High Pressure, Dixie. "Packing, Sectional, Improved. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables. Rivet Forges. | nond. 430 425 424 428 1086, 1087 1086, 1087 5086 508 419 429 422 422 422 422 422 422 422 422 42 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Hangers, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, Ir. ed. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables Rivet Forges. "Sets. | mond .430 .420 .1084 .1086, 1087 .1080 .504 .419 .421 .422, 425 .418 .422, 425 .17 .mprov3 .2 .1 .105 .500 .1053 .1033 .1112 .552-554 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixic. "Packing, High Pressure, Dixic. "Packing, Hydraulic, Waterproof, Inc. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables Rivet Forges. "Sets. "Tongs. | mond. 430 425 428 1086, 1087 1086, 1087 1080 504 419 421 422 422 422 422 422 422 422 422 422 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor. "Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, I. ed. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables. Rivet Forges. "Sets. "Tongs. | mond. 430 425 422 428 1084 1086, 1087 564 419 422, 425 422 422 17 10 10 10 10 10 10 10 10 10 10 10 10 10 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixic. "Packing, Government Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables Rivet Forges. "Sets. "Tongs. Riveted Drive Chain. "Pine Spirel American. | mond. 430 425 428 1086, 1087 1086, 1087 1080 564 419 421 422 422 422 422 422 422 422 422 422 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, I. ed. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables Rivet Forges. "Sets. "Tongs. Riveted Drive Chain. "Pipe, Spiral, American. "Pipe, Flagand Firtings, Soire! | mond. 430 425 424 428 428 428 438 449 449 429 422 427 428 428 428 429 429 429 429 420 420 420 430 440 440 450 460 460 460 460 460 460 460 460 460 46 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, It ed. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables. Rivet Forges. "Sets. "Tongs. Riveted Drive Chain. "Pipe, Spiral, American. "Pipe Flanged Fittings, Spiral. | mond. 430 425 424 428 1086, 1087 1088 564 419-421 422, 425 422 422 422 422 422 422 422 422 422 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, I. ed. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables. Rivete Forges. "Sets "Tongs "Riveted Drive Chain. "Pipe, Spiral, American. "Pipe Flanges, Spiral. "Pipe Flanges, Spiral. | mond. 430 425 428 428 428 428 428 428 449 429 421 422 422 422 422 422 422 422 422 422 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, Improved. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables. Rivet Forges. "Sets. "Tongs. Riveted Drive Chain. "Pipe, Spiral, American. "Pipe Flanged Fittings, Spiral. "Pipe Flanged, Spiral. "Sawdust Chain. | mond. 430 425 424 424 428 1086, 1087 1080 504 419 421 422 422 422 422 422 422 422 422 422 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, High Pressure, Dixie. "Packing, Hydraulic, Waterproof, I. ed. "Packing, Red Core, Helicoid. "Packing, Red Core, Helicoid. "Packing, Sectional, Improved. Rings, Toe. Rip Saw Sharpeners, Automatic. "Saws. Ripping Tables. Rivet Forges. "Sets. "Tongs. Riveted Drive Chain. "Pipe, Spiral, American. "Pipe Flanged, Fittings, Spiral. "Pipe Flanged, Spiral. "Sawdust Chain. "Sawdust Chain. "Sawdust Chain. | mond. 430 425 428 428 428 428 428 428 449 429 429 420 420 420 420 420 420 420 420 420 420 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, Sectional, Improved. "Packing, Sectional, Improved. "Packing, Sectional, Improved. Rip Saw Sharpners, Automatic. "Saws. Ripping Tables Rivet Forges. "Tongs. "Tongs. Riveted Drive Chain. "Pipe, Spiral, American. "Pipe Flanged Fittings, Spiral. "Pipe Flanges, Spiral. "Sawdust Chain. "Sawdust Chain. "Sawdust Chain Sprocket Wheels. Riveting Hammers. | mond. 430 425 424 428 1086, 1087 1080 564 419-421 422 422 422 422 422 422 422 422 422 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond Patent. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, Sectional, Improved. Rings, Toc. Rip Packing, Sectional, Improved. Rings, Toc. Rip Saw Sharpeners, Automatic. "Saws. "Sets "Tongs. Riveted Drive Chain "Pipe Flanged Fittings, Spiral. "Pipe Flanged, Spiral. "Pipe Flanged, Spiral. "Sawdust Chain Sprocket Wheels. Riveting Hammers, Pneumatic. | mond. 430 425 428 428 428 428 428 428 449 429 422 422 422 427 428 428 429 422 429 422 420 560 1054 1053 331 331 230, 232 334, 335 509 |
| Rings, Toe Rip Saw Sharpeners, Automatic Saws Ripping Tables Rivet Forges Sets. Tongs Riveted Drive Chain Pipe, Spiral American Pipe Flanged Fittings, Spiral Pipe Flanged, Spiral Sawdust Chain Sawdust Chain Hammers Hammers Hammers | 560 1054 1093 1112 552-554 35 543 331 229 231 230, 232 334, 335 509 |
| Rings, Toe Rip Saw Sharpeners, Automatic Saws Ripping Tables Rivet Forges Sets. Tongs Riveted Drive Chain Pipe, Spiral American Pipe Flanged Fittings, Spiral Pipe Flanged, Spiral Sawdust Chain Sawdust Chain Hammers Hammers Hammers | 560 1054 1093 1112 552-554 35 543 331 229 231 230, 232 334, 335 509 |
| Rings, Toe Rip Saw Sharpeners, Automatic Saws Ripping Tables Rivet Forges Sets. Tongs Riveted Drive Chain Pipe, Spiral American Pipe Flanged Fittings, Spiral Pipe Flanged, Spiral Sawdust Chain Sawdust Chain Hammers Hammers Hammers | 560 1054 1093 1112 552-554 35 543 331 229 231 230, 232 334, 335 509 |
| Rings, Toe Rip Saw Sharpeners, Automatic Saws Ripping Tables Rivet Forges Sets. Tongs Riveted Drive Chain Pipe, Spiral American Pipe Flanged Fittings, Spiral Pipe Flanged, Spiral Sawdust Chain Sawdust Chain Hammers Hammers Hammers | 560 1054 1093 1112 552-554 35 543 331 229 231 230, 232 334, 335 509 |
| Rings, Toe Rip Saw Sharpeners, Automatic Saws Ripping Tables Rivet Forges Sets. Tongs Riveted Drive Chain Pipe, Spiral American Pipe Flanged Fittings, Spiral Pipe Flanged, Spiral Sawdust Chain Sawdust Chain Hammers Hammers Hammers | 560 1054 1093 1112 552-554 35 543 331 229 231 230, 232 334, 335 509 |
| Rings, Toe Rip Saw Sharpeners, Automatic Saws Ripping Tables Rivet Forges Sets. Tongs Riveted Drive Chain Pipe, Spiral American Pipe Flanged Fittings, Spiral Pipe Flanged, Spiral Sawdust Chain Sawdust Chain Hammers Hammers Hammers | 560 1054 1093 1112 552-554 35 543 331 229 231 230, 232 334, 335 509 |
| Rigid Pillow Blocks, Bond. "Ring Oiling Post Boxes, Bond Rigs, Drive, Conveyor, Sawdust. "Drive, Live Roll. Ring Dogs. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Bond. "Oiling Pillow Blocks, Dodge. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Boxes, Bond. "Oiling Post Hangers, Bond. "Packing, High Pressure, Dixie. "Packing, Hort-unite. "Saws. Ripping Tables Rivet Forges "Sets. "Tongs Riveted Drive Chain "Pipe Flanged Fittings, Spiral. "Pipe Flanged Fittings, Spiral. "Pipe Flanged Fittings, Spiral. "Sawdust Chain Sprocket Wheels. Rivetts "Boiler. "Coopers" "Hammers. "Boiler. "Coopers" "Hame "Structural. Rivets and Burrs, Belt. "and Burrs. Coopers" | 560 1054 1093 1112 552-554 35 543 331 229 231 230, 232 334, 335 509 |

| Robins' Troughing Carriers Rock Crushers, Steel, Champion Drill Hose Couplings Faced Stone Siding, Steel Rod, Pump, Steel Rod Couplings, Pump Oil Cups, Automatic Oil Cups, Champion Rods, Brass, High Cleaner, Tube, Boiler Drill Fibre Stay Roll Ridge Cap Roller Bushed Chain, Malleable Chain, Steel Rail Benders Tube Expanders Rollers, Concave | Page |
|---|-------------------|
| Robins' Troughing Carriers | 349 |
| " Drill Hose Couplings | 484 |
| " Faced Stone Siding, Steel | 606 |
| Rod, Pump, Steel | 1011 |
| Rod Couplings, Pump | 1011 |
| " Oil Cups, Automatic | 100 |
| Rods Brass High | 316 |
| "Cleaner, Tube, Boiler | 40 |
| " <u>Drill</u> | 765 |
| " Fibre | 18 |
| Poll Pidge Can | 605 |
| Roller Bushed Chain, Malleable | 337 |
| " Chain, Steel | 339 |
| " Rail Benders | 527 |
| "Tube Expanders | 44 |
| Rollers, Concave | 587 |
| " Land | 486 |
| " Lawn | 486 |
| "Door, Car. "Land. "Lawn. "Return, Standard. Rolling Chains. | 349 |
| Rolling Chains | 381 |
| Kolls, Bending, | 1070 |
| " Screw | 1079 |
| Roof Bolts | 625 |
| " Paint, Cameroid | 603 |
| Roofing, Cement, Flexible, Carey | 600 |
| " Iron, Corrugated | 605 |
| " Pandy Camproid | 601 |
| " Ready Prepared | 602 |
| " V Crimped | 605 |
| Roofing Brushes | 603 |
| " Caps | 603 |
| " Felt | 602 620 |
| " Soldering Conners | 875 |
| Root Reducing Valves | 121 |
| Rope, Bull | 376 |
| " Haulage | 386 |
| " Hoisting, Extra Plante | 262 264 |
| " Hoisting, Flough Steel | 382, 383 |
| " Lariat | 376 |
| " Manila | .375-378 |
| " Sisal | . 375-376 |
| Tiller, Cast Steel | 388 |
| " Transmission | 386 |
| " Wire | 382-388 |
| " Wire, Galvanized Iron | 387 |
| " Wire, Splicing | 388 |
| Mone Driving System Dodge American | 433-425 |
| " Fastenings, Wire | .389-391 |
| " Packing, Asbestos | 17 |
| " Power Transmission | 378 |
| Sheaves, Manila | 379 |
| Rose Chucking Reamers | 718 |
| " Gasket Cutters | 869 |
| " Washer Cutters | 869 |
| Rosin Sized Sheathing | 602 |
| Rotary Force Pumps, Rumsey | 990, 995 |
| " Brass Unions | . 02U, 321 290 |
| Roughing Taper Reamers | 715 |
| Round Hand Punches | 573 |
| " Iron, Weight of | 588 |
| " Jaw Tongs | 544 |
| Nose Unisels | 272 |
| " Sieves | 547 |
| " Steel, Weight of | 588 |
| " Tucks Packing | 11 |
| Tucks Packing Rounders and Guides, Saw, Combined Rounding Hammers | 1050 |
| Lawn Lawn Return, Standard Rolling Chains Rolls, Bending, Live Screw Roof Bolts Paint, Cameroid Roofing, Cement, Flexible, Carey Iron, Corrugated Metal, Asbestos Protected Ready, Cameroid Ready Prepared V Crimped Roofing Brushes Caps Felt Nails Soldering Coppers Root Reducing Valves Rope, Bull Haulage Hoisting, Extra Pliable Hoisting, Standard Lariat Manila Sissal Tiller, Cast Steel Tiller, Cast Steel Tiller, Cast Steel Tiller, Galvanized Iron Wire, Galvanized Iron Wire, Galvanized Iron Wire, Splicing Rope Dressing, Manila Driving System, Dodge- American Fastenings, Wire Packing, Asbestos Power Transmission Sheaves, Manila Sheaves, Manila Sheaves, Manila Sheaves, Mire Rose Chucking Reamers Gasket Cutters Washer Cutters Rosin Sired Sheathing Rotary Force Pumps, Rumsey Rough Brass Fittings Brass Unions Roughing Taper Reamers Round Hand Punches 'Iron, Weight of Jaw Tongs Nose Chiesels Nose Pliers Sieves Steel, Weight of Tucks Packing Rounders and Guides, Saw, Combined Rounders and Guides, Saw, Combined | 508 |
| Royal Glass Oil Cups | 108 |

| | 1 |
|----------------|--|
| Rubb | er Belting |
| •• | Diaphragms |
| | |
| | Packers |
| | Tuhing |
| •• | Tubing. Valve Balls. 63, |
| Rule | Clamps |
| Rules | , Board Boxwood Caliper |
| •• | |
| | Caliper |
| | Caliper, Slide, Steel |
| | |
| •• | Desk, Steel |
| ** | Engineers' Folding Hook, Steel Hook and Handle, Blacksmiths' |
| •• | Hook, Steel |
| | Hook and Handle, Blacksmiths' |
| ** | Inspectors' |
| ** | Inspectors' Key-Seat Log Pattern, Magic Pocket, Steel, Folding Shrink, Steel Shrinkage |
| ** | Pottern Magic |
| 44 | Pocket Steel Folding |
| ** | Shrink, Steel |
| ** | |
| •• | Steel |
| ** 25 | Steel 835 Steel, Blacksmiths' Thumb Slides, Steel |
| | Thumb Slide, Steel |
| Rums | sey Force Pumps990, 995 |
| Dunn | Triumb Sittes, steel sey Force Pumps. 990, 995 Triplex Pumps 991 ers, Joint, Asbestos. 991 ll's Ceiling Plates. Floor Plates. |
| Rues | all's Coiling Plates |
| i i | Floor Plates |
| | |
| | 8 |
| 8-C I | Pump Governors enches, Adjustable, Westcott Wrenches, Concave Handle Wrenches, Flat Handle 795 es, Pipe, Steam |
| SWr | enches, Adjustable, Westcott |
| ** | Wrenches, Concave Handle |
| 20441 | or Pine Steam |
| Safet | v Fire Bucket Tanks |
| | Fuse Set Collars, Bond Shafting Collars, Dodge |
| •• | Set Collars, Bond |
| | Shafting Collars, Dodge |
| •• | Squibs |
| •• | Valves, Brass |
| | Valves, Iron Body |
| •• | Values Pon Bress American |
| ** | Valves, Pop. Iron Body, American |
| •• | Water Columns, Pittsburgh |
| " | Water Columns, Reliance |
| Salen | Steel Elevator Buckets |
| Sams | on Batteries |
| Sand | Cloth |
| | Sarang |
| ** | Squibs. Valves, Brass. Valves, Iron Body. Valves, Low Pressure. Valves, Pop, Brass, American. Valves, Pop, Iron Body, American. Water Columns, Pittsburgh. Water Columns, Reliance. Steel Elevator Buckets. on Batteries. Cloth. Paper. Screens. |
| Sanit | ary Well Caps |
| Sash | Bits |
| ** | Cora, Copper |
| •• | Cord, Galvanized |
| | Cord, Iron |
| | Lord, Tinned |
| Saun Saur I | Rlados Hack |
| Dan 1 | Brasing Clamps |
| ** | Cord, Galvanized Cord, Iron Cord, Tinned lers Pipe Cutters Blades, Hack Brasing Clamps Brazing Tables Filers' Tools Files, Disston Filing Machines, Band Filing and Setting Apparatus, Band Frames, Hack |
| ** | Filers' Tools |
| | Files, Disston |
| ** | Filing Machines, Band |
| | Filing and Setting Apparatus, Band |
| | Chairle Adding |
| ** | Guides, Atkins |
| ** | Guides and Rounders, Combined Gummers, Disston Gummers, Hand, Circular Handles, Cross-Cut, Disston Machines, Drag, Perkins Champion Mandrels, Circular Mill Company |
| " | Gummers, Hand, Circular |
| ** | Handles, Cross-Cut, Disston |
| ** | Machines, Drag, Perkins Champion |
| ** | Mandrels, Circular1051 |

THE CAMERON & BARKLEY CO.

xxxiii

| | Page | Page |
|------|---|--|
| Saw | Mill Carriages 1066 Mill Dogs, Knight's Ideal 1049 | Scales, Warehouse, Dormant |
| ** | Mill Dogs, Knight's Ideal | " Wheelbarrow 495 |
| •• | Muli Feeds, Steam, Browniee 1079 | Scarfing Machines Rand Saw 1059 |
| ** | Mill Head Blocks 1066 | Sco-co Paint 603 |
| 44 | Mill Machinery 1004-1000 | |
| •• | Mill Wheel Guarde and Track Cleanare 1070 | Scoop Duckets |
| ** | Mill Head Blocks 1006 Mill Machinery 1064-1088 Mill Wheel Guards and Track Cleaners, 1070 Mills, American 1068, 1069 1068, 1069 | Coops |
| ** | Mills, Band 1065, 1067, 1068 Mills, Circular 1065, 1067, 1068 | Scotch Gauge Glasses |
| | Mills, Of | Scott Brass Gate Valves |
| •• | Milis, Circular | Scrapers, Drag |
| | Mills, Lane | Secop Buckets |
| 44 | Pulleys and Stands, Band1000 | Tube40,41 |
| ** | Sets | " Wheel |
| | Mills, Lane 1067 Pulleys and Stands, Band 1068 Sets. 1048 Sets, Aikens' 1040 | Tube. 40, 41 " Wheel 476, 477 Screens, Coal 547 " Revolving, Champion 485 |
| | | Revolving, Champion 485 |
| •• | Sets, Morrill's | 1 Sand |
| | Sets, Stearns'1040 | Screw Anchors, Star |
| •• | Sets, Morrill's | " Cutting Lathes, Star 905 |
| •• | Sharpeners, Circular, Automatic 1054 | " Geared Chain Hoists, Duplex 450 |
| •• | Suarpeners, Cross Cut, Automatic1034 | " Jacks, Telescope, Duff 440 |
| ••• | Sharpeners and Cummers Atkins 1052 | " Drivers |
| •• | Stretchers, Band | " Pitch Gauges 857 |
| •• | Swage Shapers | " Plates, Little Giant |
| •• | Stretchers, Band 1057 Swage Shapers 1043, 1046 Swages, Disston 1041 Swages, Hanchett 1043, 1044 | Seriew Anchors, Star. 223 "Cutting Lathes, Star. 905 "Geared Chain Hoists, Duplex 450 "Jacks, Telescope, Duff 440 "Drivers 862, 870 "Pitch Gauges 857 "Plates, Little Giant 781-783 "Punches, Steel 548 "Rolls 1079 "Slotting Cutters 748 "Rolls 748 |
| ** | Swages, Hanchett | " Rolls |
| •• | Swages, White | " Slotting Cutters 748 |
| •• | Swages, White 1045 Tables, Combination 1098 Tables, Crescent 1099 | Rolls |
| •• | Tables, Crescent | " and Timber Braces, Combined 517 |
| ** | Tools, Crescent | Screwed Fittings, Cast Iron, Extra Heavy 275 |
| •• | Tools, Improved 1039 | " Fittings, Cast Iron, Long Sweep 277, 279 |
| •• | Wedges | " Fittings, Cast Iron, Standard 260-269 |
| Sawe | lust Chain, Riveted | Screws, Can 210 |
| •• | Wedges 564 lust Chain, Riveted 334, 335 Conveyors 1069, 1086, 1087 | Screws, Can 210 Cap 610-612 " Coach 628 " Collar 615 |
| ** | Forks | " Coach 628 |
| Sawi | nakere' Anvila 1047 | " Collar 615 |
| ** | Hammers 1047, 1048 Leveling Tables 1047 Straight Edges 1047 | " Goose Neck |
| ** | Leveling Tables 1047 | " Hand |
| 64 | Straight Edges 1047 | " Hanger 699 |
| •• | Tools | " Hanger |
| 8 | Band | " Lag |
| ~ | Band, Crescent 1100 | " Machine, Brass |
| •• | Rend Simonds 1021 | " Machine, Iron |
| •• | Band, Simonds 1031 Butting 1032 Circular, Disston 1025, 1026 Circular, Simonds 1022–1024, 1030 Circular, Simonds 1022–1024, 1030 | " Cot Toom 612 |
| ** | Cinciles Director 1002 | " Set, Iron |
| | Cincular Simonda 1020 1021 1020 | " Thumb |
| •• | Concave, Simonds | I numo |
| ** | Cases-Cut Director 1024 | Scribers |
| •• | Cross-Cut, Disston. 1034 Cross-Cut, Simonds. 1033 | Scroll Chucks, Union 769 Chucks, Westcott 773 Scamless Brass Tubing 316, 317 Steel Tubing, Shelby 228 |
| | Deca 1020 | Chucks, Westcott |
| ** | Drag 1032 Edger, Simonds 1028 | Camiess Drass Tubing |
| •• | Grooving, Simonds | Steel Tubing, Shelby |
| ** | Block Bland 224 | Seating Tools |
| •• | Hack Domes 599 | Section Hand Cars |
| ** | Useding Simonds | Liners and Protractors |
| ** | Turner Steems 1079 | sectional ripe Covering |
| ** | Hack, Hand 534 Hack, Power 533 Heading, Simonds 1027 Jump, Steam 1078 Kack Parkins 1108 | Section Hand Cars |
| ** | Knot. Perkins 1106 Metal, Cold, Lea-Simplex 532 | Self-Cleaning Water Gauges |
| 44 | Mitter Cincada | Sen-Closing Gate Hinges |
| 44 | Pail Partable | Uii Cups |
| | Mitre, Simonds 1030 Rail, Portable 531 Resawing, Simonds 1028 | Self-Closing Gate Hinges |
| 44 | | Seir Contained Excelsior Machines |
| ** | Rip | Seit-Dumping Phosphate Cars |
| ** | Stille Simonds | Semi-rinished Nuts |
| | Shingle, Simonds 1027 Siding, Simonds 1028 Slitting, Metal 747 Swing 1077, 1078 Swing, Inverted 1095 | Self-Dumping Phosphate Cars. 479 Semi-Finished Nuts 633 Semibronze Coil Packing 6 "Flat Gaskets 15 |
| ** | Contains, Metal | Flat Gaskets |
| ** | Swing1077, 1078 | Speet Packing |
| ** | swing, Inverted | Tubular Gaskets. 16 Seneca Falls Speed Lathes. 904 |
| | Vencer 1102 Web, Felloe 1032 | Seneca Falls Speed Lathes |
| | Web, Felloe | Sensitive Drill Presses 891 Sentinel Glass Oil Cups 191 |
| | Wood, Cord1112 | Sentinel Glass Oil Cups |
| ocen | s, Counter | Separators, Oil, Austin |
| | Draftsmen's | " Oil, Cochrane |
| ** | Fairbanks | |
| ** | Grocers' | Steam, Cochrane |
| ** | Improved | " Steam, Cochrane 162 " Steam, Pittsburgh 163 Service Boxes 1019 |
| ** | | Service Boxes1019 |
| ** | Platform, Counter 496 | I "Royae Adiustable 1090 |
| • | Platform, Portable 494 | Set Blocks, Channeling |
| •• | Stock | Set Blocks, Channeling 1039 103 |
| •• | Track, Railway | " Hammers, Blacksmiths'542 |
| ** | Scales, Transportation | " Length Pumps |
| ** | Ilinion 496 | " Screw Wrenches 798 " Screws, Iron 613 |
| ** | Wagon | " Screws, Iron |
| | | · · · · · · · · · · · · · · · · · · · |

xxxiv

THE CAMERON & BARKLEY CO.

| Page Page Set Screws, Steel | |
|---|--|
| Set Screws, Steel | Ship Augers. |
| Sets, Caliper, Micrometer 848 | Builders |
| " Nall | " Mauls |
| " Oiler, Steamboat | Shoe Rasps Shoes, Drive |
| " Rivet 35 | Shoes, Drive. |
| " Saw | Shop Dusters |
| " Saw, Aikens' | Power H Shouldering S |
| " Saw Morrill's 1040 | Shovels |
| " Saw. Stearns' | Shrink Rules, |
| Sets of Drills | Shrinkage Ru |
| Sewer Pipe | Shuts, Cold |
| Sheekles Anghor Din 565 | Siamese Conn "Coupling |
| Shafting, Key-Seating 394 | Side Cutting |
| " Shouldering 394 | " Tools, A |
| " Steel | Side Cutting I "Tools, A Siding, Brick, "Metal. |
| Sharting Collars, Salety, Dodge 412 | " Metal |
| " Couplings, Compression, Bond 411 | " Stone, I " Weather |
| " Couplings, Compression, Dodge 410 | Siding Sawa S |
| "Couplings, Dodge 410 | Sieves, Coal |
| " Couplings, Sleeve, Dodge 412 | " Sand Sight Feed Lo |
| " Hangers, Dodge 414-417 | " Feed Lo |
| Shapers, Crank, American 907, 908 | " Feed Lu " Feed Lu " Feed Lu |
| " Double Spindle 1094 | " Feed Lu |
| " Swage, Saw | " Feed Oi " Feed Va |
| Sharpeners Knife Carborundum 870 | " Feeds, I |
| " Saw. Band. Automatic | Silent Chain |
| " Saw, Circular, Automatic 1054 | Silent Chain (Silk Cloth Towels . |
| " Saw, Cross Cut, Automatic 1054 | " Towels. |
| Sharpeners and Gummers, Saw, Atkins 1053 Sharpening Stones, Carborundum, 668 | Silver Solder. Simonds Band |
| Shaving Grate Bars | " Circular |
| Shears, Bench | " Circular " Concave |
| " Hand, Portable | l "Cross-C |
| " Splitting Armor Plate 885 | " Edger S " Groovin |
| " Squaring | " Heading |
| Shears and Punches, Combined 548, 886, 887 | " Mitre S |
| Shapes, Carborundum Wheel | Resawir |
| " Rosin Sized 602 | " Shingle |
| Sheaves, Iron, Dodge | Sinkers, Die |
| " Rope, Manila, | Simonds Sidir Sinkers, Die Sisal Lath Ya |
| " Rope, Wire | " Rope Sizes of Cast |
| " Iron Weight per Square Foot 584 | " of Tan |
| " Iron Folders | " of Tap I " of U. S. Skidder Block |
| " Lead 318 | Skidder Block |
| " Lubricator, Graphite, Randall 24 | Skidding Ton |
| " Packing Puroid 14 | Skids Skinner Drill |
| " Packing, Red, Aurora | " Face Pl |
| Shears and Punches, Combined 548, 886, 887 " and Punches, Combined, Buffalo 884 Sheathing, Metal, Hy-Rib 599 " Rosin Sized 602 Sheaver, Iron, Dodge 379 " Rope, Wire 392 Sheet Iron 584 " Iron Weight per Square Foot 584 " Iron Folders 880-882 Lead 318 Lubricator, Graphite, Randall 24 " Packing, Cloth Insertion 13 " Packing, Cloth Insertion 13 " Packing, Red, Aurora 12 " Packing, Red, Aurora 12 " Packing, White, Magnolia 12 " Steel 584-586 " Steel, Weight per Square Foot 584 Sheel, Weight per Square Foot 584 Sheeta, Awaing, Iron, Corrugated 605 " Fibre 18 " Galvanized, Crimped 606 Shelby Seamless Steel Tubing 228 Shell Drill Arbors 736 " Drills 711 " End Mill Arbors 735 | " Lathe C |
| " Packing, White, Magnolia | " Planer (|
| " Steel Weight per Square Foot. 584 | Skins, Chamo Slab Conveyo |
| Sheets, Awning, Iron, Corrugated 605 | '' Slashers |
| " Fibre 18 | Slates, Metal |
| " Galvanized | Slating Nails Sledge Handle |
| Shelby Seamless Steel Tubing 228 | Sledges, Black |
| Shell Drill Arbors | Sledges, Black Sleeve Scriber |
| " Drills | , enarcing |
| End Mill Arbors | Sleeves, Dred |
| " Reamers | " Drill, St " Extension |
| Sherwood Oil Pumps | " Ratchet |
| Shingle Bands | Slicks, Corner |
| Bunchers, Iron Frame | Slicks and Be |
| " Machines, Perkins 1102 | and Spo Slide Caliper |
| " Nails | " Calibers |
| " Packers, Perkins 1107 | " Calipers Slips, Carbort |
| Drills | Slitting Saws, "Shears, |
| Sningles, Metal, Stamped 607 | Slot Cutters, |
| omb vasco | Jose Currers, |

| . ' | Page |
|--|--|
| Ship Augers | 572 |
| " Builders' Hammers | 509 |
| " Mauls | 656, 659 |
| Shoes, Drive | 1013 |
| Pile | 474 |
| Shop Dusters. " Power Hack Saws. Shouldering Shafting. Shovels. Shrink Rules, Steel. Shrinkaro, Rules. | 580 |
| Power Hack Saws | 533 |
| Shouldering Shafting | 394 |
| Shrink Dulas Steel | 504 |
| Shrinkaga Rules | 867 |
| Shrinkage Rules | 565 |
| Siamese Connections | 55 |
| Siamese Connections | 55 |
| Side Cutting Pliers | 874 |
| Side Cutting Pliers Tools, Armstrong Siding, Brick, Steel Metal Stone, Rock Faced, Steel | 825, 826 |
| " Matel | 606 |
| " Stone, Rock Faced, Steel | 606 |
| " Weather-Proof | 606 |
| Weather-Proof | 1028 |
| Sieves, Coal | 547 |
| | 041 |
| Sight Feed Locomotive Lubricators | 199 |
| " Food Lubricators Glass Rody | 100 |
| " Feed Lubricators, Lunkenheimer | 196, 198 |
| Feed Lubricators, Detroit Feed Lubricators, Glass Body Feed Lubricators, Lunkenheimer Feed Oil Cups Feed Valves | 189 |
| " Feed Valves | 193 |
| recus, independent | 200 |
| Silent Chain Gear | 333 |
| Silk Cloth | 19 |
| Silver Solder 5 | |
| Simonds Band Saws | 1031 |
| Silver Solder | 24, 1030 |
| " Concave Saws | 1029 |
| " (Poss-Cut Saws | 1033 |
| Edger Saws Grooving Saws Heading Saws | 1028 |
| " Hooding Saws | 1030 |
| " Mitre Saws | 1030 |
| " Mitre Saws | 1028 |
| | 1027 |
| Simonds Siding Saws Sinkers, Die Sisal Lath Yarn | 1028 |
| Sinkers, Die | 662 |
| " Pone | 376 375, 376 |
| " Rope | 260-263 |
| " of Tap Drills | 696, 697 |
| " of II S Gauge Actual Diagram of | |
| | 583 |
| Skidder Blocks | 583 |
| Skidder Blocks | 583 449 563 |
| Rope Sizes of Cast Iron Fittings of Tap Drills of U. S. Gauge, Actual, Diagram of Skidder Blocks Skidding Tongs Skidding Tongs | 583 449 563 493 |
| Skinner Drill Chucks | 767 |
| Skinner Drill Chucks | 767 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks | 767 778 774-776 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks | 767 778 774-776 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved | 767 778 774–776 779 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved "Slashers Slates, Metal Slating Nails Sledges, Blacksmiths Sledges, Blacksmiths Sleeve Scribers, Adjustable "Shafting Couplings, Dodge Sleeves, Dredging "Drill, Steel "Extension Friction Clutch Dodge | 767 778 774-776 779 1085 1113 607 639 511 510 865 412 49 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved "Slashers Slates, Metal Slating Nails Sledges, Blacksmiths Sledges, Blacksmiths Sleeve Scribers, Adjustable "Shafting Couplings, Dodge Sleeves, Dredging "Drill, Steel "Extension Friction Clutch Dodge | 767 778 774-776 779 1085 1113 607 639 511 510 865 412 49 |
| Skinner Drill Chucks Face Plate Jaws Lathe Chucks Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved Slates, Metal Slating Nails Sledge Handles Sledge Handles Sledges, Blacksmiths' Sleeve Scribers, Adjustable Shafting Couplings, Dodge Sleeves, Dredging Drill, Steel Extension, Friction, Clutch, Dodge. Ratchet Slicks, Corner, Moulders' | 767 778 774-776 779 1085 1113 607 639 511 510 865 412 49 |
| Skinner Drill Chucks Face Plate Jaws Lathe Chucks Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved Slates, Metal Slating Nails Sledge Handles Sledge Handles Sledges, Blacksmiths' Sleeve Scribers, Adjustable Shafting Couplings, Dodge Sleeves, Dredging Drill, Steel Extension, Friction, Clutch, Dodge. Ratchet Slicks, Corner, Moulders' | 767 778 778 774 776 779 19 1085 1085 511 510 865 412 49 680 680 5576 577 |
| Skinner Drill Chucks Face Plate Jaws Lathe Chucks Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved Slashers Slates, Metal Slating Nails Sledge Handles Sledges, Blacksmiths Sleeve Scribers, Adjustable Sheves, Dredging Drill, Steel Extension, Friction, Clutch, Dodge. Ratchet Slicks, Corner, Moulders Slicks and Beads and Spoons | 767 778 778 778 779 19 1085 1113 607 511 510 510 510 510 510 510 510 510 510 |
| Skinner Drill Chucks Face Plate Jaws Lathe Chucks Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved Slashers Slates, Metal Slating Nails Sledge Handles Sledges, Blacksmiths Sleeve Scribers, Adjustable Sheves, Dredging Drill, Steel Extension, Friction, Clutch, Dodge. Ratchet Slicks, Corner, Moulders Slicks and Beads and Spoons | 767 778 778 774 776 779 1085 1113 639 511 865 412 492 680 680 680 680 576 576 576 834 |
| Skinner Drill Chucks "Face Plate Jaws "Lathe Chucks "Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved "Slashers Slates, Metal Slating Nails Sledge Handles Sledges, Blacksmiths' Sleeve Scribers, Adjustable "Shafting Couplings, Dodge Sleeves, Dredging "Drill, Steel Extension, Friction, Clutch, Dodge. Slicks, Corner, Moulders' Slicks and Beads "and Spoons Slide Caliper Rules, Steel "Calipers, Pocket Slips, Carborundum | 767 778 778 778 779 19 1085 1113 607 639 511 510 510 680 412 412 680 680 680 680 8865 8866 8866 8866 886 |
| Skinner Drill Chucks Face Plate Jaws Lathe Chucks Planer Chucks Skins, Chamois Slab Conveyor Cleats, Coleman Improved Slashers Slates, Metal Slating Nails Sledge Handles Sledges, Blacksmiths Sleeve Scribers, Adjustable Sheves, Dredging Drill, Steel Extension, Friction, Clutch, Dodge. Ratchet Slicks, Corner, Moulders Slicks and Beads and Spoons | 767 778 778 774 776 779 1085 1113 639 511 865 412 492 680 680 680 680 576 576 576 834 |

| Page | |
|--|--|
| Slotted Angle Flanges, Cast Iron271 | Split Sprocket Wheels |
| Slotter Tools, Armstrong | Splitting Machines, Wood |
| Stotting Cutters, Screw | |
| Smelter Barrows 490 Smith Concrete Mixers 482, 483 | Spoons Moulders' 576 |
| Smokestack Paint 603 Smokestacks, Gordon Hollow Blast 945 | Spoons and Hearts |
| Smokestacks, Gordon Hollow Blast 945 | " and Slicks |
| Smooth-On Compounds 22 Smooth Steel Wire 649 | |
| Span Lavar Class Oil Cups 101 | |
| Snatch Blocks, Malleable Iron Shell 443 Blocks, Wire Rope 445, 447 Blocks, Wood 443 Snifting Valves, Brass, American 115 | " Cotters |
| " Blocks, Wire Rope | " Dividers |
| Blocks, Wood | " Keys, Flat |
| | |
| Soapstone Packing | Sprinkler Clips |
| Socket Wrenches | Sprinkler Clips 310 Sprinklers, Hose 54 |
| Soapstone Packing 17 Socket Wrenches 796, 797 "Wrenches, Giant 519 "Wrenches, Ratchet, Keystone 519 | Lawn |
| | |
| " Drill | " Wheels |
| Drill, Use-Em-Up. 679 | " Wheels, Detachable Link Chain340-343 |
| " Peavey 560 | " Wheels, Ley Bushed Chain |
| " Ratchet 520 |) '' Wheels Transfer Chain 345 |
| Wire Rope 390 Soft Dusters, Moulders' 579 Soil Pipe Cutters 801 Solder, Half and Half 514 | " Wheels, Transfer Chain |
| Soft Dusters, Moulders' | Sprockets, Jacker, Log1083 |
| Soil Pipe Cutters | Spuds, Bark |
| CHIVET 514 1048 | () '' (+eara 374 |
| "Spelter. 514 "Wiping 514 "Wire 514 | Saucas Flan Danking Chicago |
| " Wiping 514 | Flax Packing, Commercial 9 |
| Solder Pots | " Flax Packing, Gilt Edge 9 |
| Soldering Conners 975 | " Flax Packing, Navy 9 |
| Solid Bolt Dies | " Iron, Weight of |
| Solid Bolt Dies 780 Box Vises 816 " Copper Gaskets, Corrugated 308 | Flax Packing, Commercial 9 |
| " Copper Gaskets, Corrugated | ' Shank Ratchet Sleeves |
| " Copper Hammers | |
| " Pulleys, Cast Iron, Dodge | " Steel, Weight of 588 |
| " Reamers | " Tucks Packing |
| Spacing Center Punches | Squares, Caliper |
| Spades. 504 | " Combination |
| Spanners, Face | " Double |
| Hose | " Draftsmen's |
| " Pin | Moulders |
| Special Cast Iron Fittings 271 | 945 |
| " Combination Chain 338 " Pipe Cut to Order 221 Specials for Cast Iron Pipe 236, 237 | |
| Pipe Cut to Order | Try |
| Speed Indicators | Squaring Sheers 983 989 |
| " Lathes, Seneca Falls 904 | Squibs, Safety |
| " of Circular Saws | Stacks, Smoke, Gordon Hollow Blast 945 |
| Spelter | |
| Spike Pullers | " Motel Shingles 607 |
| Snikes Bost 637 | Stomps Namo Steel 570 |
| Railroad 637 Street Railway 637 | Standard Back Pressure Valves |
| " Street Railway | |
| " Wire, Steel | '' Ruttorffy Volvoe Brose 75 |
| Spindle Stay Rolt Tans 769 | " Rutterfly Values Iron Rody 97 |
| Spiral Conveyor Boxes | Cast Iron Fittings |
| Spiral Conveyor Boxes 353, 356 " Conveyor Hangers 356 " Conveyors, Steel 354 | Channels, Weight of |
| | " Ory Kilns 1089 |
| " Packing, Hot Water, Carolina 5 | " Dry Kilns 1089 " Edison Base Lamps 1120 |
| Packing, Improved, Helicoid 3 | Flanges and Templates for Drilling 294 |
| " Riveted Pine American 900 | " Hoisting Rope |
| Packing, Hot Water, Carolina 5 Packing, Hot Water, Carolina 5 Packing, Improved, Helicoid 3 Packing, Red Core, Helicoid 4 Riveted Pipe, American 229 Riveted Pipe Flanged Fittings 230 Riveted Pipe Flanges 230 Riveted Pipe Flanges 230 | Flanges and Templates for Drilling |
| " Riveted Pipe Flanges | " Reducing Companion Flanges |
| Riveted Pipe Flanges | " Return Rollers 349 |
| Wire Rope | " Square Flax Packing 17 " Steel "I" Beams 591 " Steel Tees, Weight of 592 |
| | |
| " Pulleys, Wood, Dodge 395 | " Taper Pins |
| Palleys, Wood, Dodge 395 Ring Pipe Hangers 311 | " Taper Pins |

xxxvi THE CAMERON & BARKLEY CO.

| Page | Page |
|---|--|
| Standard Throttle Valves, Iron Body 87 | Steel Belt Lacing, Bristol's 33 |
| "Unions, Malleable Iron | " Roiler Rolts 62 |
| Standards, Pump, Force | Boiler Flanges 23 Brick Siding 60 Cable Conveyors 35 Chain, Manganese, Tisco 37 |
| Wire Gauge | " Cable Conveyors |
| " Micrometer 848 " Pulley, Mule, Dodge 429 | " Clamps |
| " Switch539 | " Classification |
| Switch 539 Tool, Portable 833 Vise, Portable 833 | "Classification, Novo |
| " Vise, Stationary 833 Stands and Pulleys, Band Saw 1060 | " Desk Rules 83 |
| Stands and Pulleys, Band Saw | " Drag Chain 336 " Drill Sleeves 686 |
| Staple Hooks. 310 Star Expansion Bolts. 629, 630 | " Drill Sockets |
| Star Expansion Bolts | " Elevator Boots |
| " Screw Anchors 629 " Screw Cutting Lathes 905 | " Elevator Buckets, Extra Heavy |
| | " Elevator Buckets, Extra Heavy 366 " Elevator Buckets, Salem 36 |
| Starrett's Tools | Fasteners, Corrugated 64 |
| Stave Jointers1110 | " Fittings, Hydraulic |
| " Knives | " Gears, Manganese, Tisco |
| Stay Bolt Taps | 1100k 1 laucs |
| " Bolts, Boiler | " Hook Rules |
| " Rods 625 Steam Baling Presses 1134 " Cock Wrenches 106 | " Hose |
| " Cock Wrenches | in Hexagons 39 in Squares 39 Lamps 20 |
| Cocks, Brass. 106 Engines, Erie City. 931-936 Engines, Vertical, O & S. 980 | " Lamps |
| " Engines, Vertical, O & S | |
| Feeds, Direct-Acting 1074 Feeds, Twin Engine 1073 Flue Cleaners 42 Gauge Hand Pullers 104 | " Link Chain Conveyors |
| " Flue Cleaners 42 | Name Stamps |
| " Gauge Band Pullers | " Plate Planing Mill Exhausters 555 " Plumb Bobs 86- |
| " Gauges 141 | Pocket Rules, Folding 83 Pressure Blowers, Buffalo 55 |
| " Heat Gauges | " Pressure Blowers, Buffalo |
| " Hose | Pump Rod 101 Rails, Weight per Mile 63 Rock Crushers, Champion 48 |
| Gauge Syphons. 104 Gauges Syphons. 104 Gauges . 141 Heat Gauges . 142 Hammers, Bell Improved 889 Hose . 47 Hose Couplings . 52 Joint Clamps, Climax . 274 Jump Saws . 1078 Pine . 210 220 | " Rock Crushers, Champion |
| " Jump Saws | " Rock Faced Stone Siding 600 " Roller Chain 339 |
| " Pipe 219, 220 " Pipe Clamps, Emergency 274 " Pipe Saddles 273 | Rules 835-83; Rules, Blacksmiths 836 837 838 8 |
| " Pipe Saddles | " Screw Punches |
| Pumps, Emerson 947 Pumps, Fairbanks-Morse 952-962, 964, 965 | |
| " Pumps, Knowles | Shafting 39 |
| Pumps, Knowles | " Slide Caliper Rules |
| " Regulator Diaphragms 63 " Saw Mill Feeds, Brownlee 1072 | " Spiral Conveyors |
| Separators, Austin 161 | "Squares 842,84 "Straight Edges 83 "Tackle Blocks 44 "Tees, Standard, Weight of 59 |
| " Separators, Cochrane | " Straight Edges |
| Traps, Cookson | " Tees, Standard, Weight of 59 |
| " Traps, Haines Improved | " Thumb Slide Rules |
| Traps, Nason. 165 Traps, Reliance 164 Traps, Steling 166 Traps, Stering 166 Traps, Strong 164 Traps, Strong 164 | " Torches |
| " Traps, Sterling | " Towers 100 " Trolleys 45 " Tubing, Seamless, Shelby 22 |
| " Tubing | " Tubing, Seamless, Shelby |
| " Whistles | |
| Steamboat Orier Sets | Wire, Smooth 644 Wire Nails 633 Wire Spikes 633 Wire Strand, Galvanized 388 |
| " Trucks | " Wire Spikes |
| Stearns Saw Sets 1040 | " Wrenches |
| " Classification of, Novo | Steels, Butchers', Carborundum |
| " Round, Weight of 588 " Sheet. 584-586 | Wrenches |
| " Sheet | Steps, Derrick 462 |
| " Square, Weight of | Sterling Steam Traps. 166 Stiff-Legged Derricks. 46 |
| " Tool, Classification of | " Legged Straps |
| " Tool, Novo | " Legged Straps 470 Stillson Pipe Wrenches 780 Stitched Canvas Belting 3 |
| Steel Balls, Tool. 832 " Band Pipe Hangers 313 " Paralle 313 | Stock Scales 49: |
| "Barrels 211 "Bars, Concrete Re-inforcing 599 "Bars, Flat Rolled, Weight of 589, 590 | Stocking Cutters |
| " Bars, Flat Rolled, Weight of 589, 590 | " Die, Adjustable, Forbes Patent 80 |

| Page | Pag |
|--|---|
| Stocks, Die, Adjustable, Toledo 801-803 | Swing Check Valves, Iron Body, Lunkenheimer 8 |
| Stocks, Die, Adjustable, Toledo | Swing Check Valves, Iron Body, Lunkenheimer 8 "Check Valves, Iron Body, P&C 8 "Check Valves, Iron Body, Standard 7 "Joints, Brass, Lunkenheimer 12 "Saws 1077, 107 "Saws, Inverted 109 Swinging Hose Racks 57, 5 "Hose Racks 57, 5 |
| * and Dies Rolt, Adjustable, Armstrong 784 | " Joints Brass Lunkenheimer 12 |
| " and Dies, Malleable 804 | " Saws |
| " and Dies, Pipe | " Saws, Inverted |
| Stone Forks | Swinging Hose Racks57, 5 |
| " Siding Rock Faced Steel 606 | "Hose Reels. 5 Swiss Pattern Files 660-66 Switch Chains, Railroad 38 |
| " Wire 648 | Switch Chains, Railroad |
| | " Stands 53 |
| " Carborundum | Switches 53 Swivel Base Pipe Hangers 31 |
| Store Trucks | Synhone Brase 10 |
| Samu Bale Tene 761 | " Gauge, Steam 10 " Iron 10 |
| ** Bôlts | " Iron 10 |
| ** Bolts | T · |
| Edges, Draftsmen's | T Slot Cutters 74 |
| " Edges Sawmakers" 1047 | " Sangree 84 |
| Edges, Steel 838 Knives 1035, 1036 | Tables, Brasing, Saw 105 " Leveling, Sawmakers' 104 " Ripping 111 |
| " Lip Tongs | " Ripping |
| " Shank Twist, Drills 684, 685, 688, 689, | " Saw, Combination 109 " Saw, Crescent 109 Tackle Blocks, Malleable Iron Shell 44 |
| " Shank Straight Way Drills | " Saw, Crescent |
| " Way Drills, Jobbers', | " Blocks, Wire Rope |
| Way Drills, Jobbers' | " Blocks, Wire Rope |
| " Way Drills, Straight Shank 694, 695 | Take-Up Boxes, |
| Way Drills, Taper Shank 694 Way Drills, Wire Gauge 695 | Tallies Hand |
| Straightening Machines, Rail | Tallow Laid Manila Rope |
| " and Cutting Wire | Take-Ups, Floor. 36 Tallies, Hand. 14 Tallow Laid Manila Rope. 37 " Pots. 20 |
| Strainer Connections, Kieley 125 Strainers, Ejector 185 | Tamping Bars |
| " Ernerson 98 | " Shovels 50 |
| " Hose | Tank Covers |
| Injector 185 Strand, Wire, Steel, Galvanized 388 Strap Fasteners, Hose 53 | " Floats |
| Stran Fasteners, Hose 53 | Lugs |
| Strang, Mose | ' Trimmings Proumatio 100 |
| " Pipe, Tinned | " Valves. 101 Tanks, Cypress. 1003-100 " Factory Mutual 100 |
| Street Lamps 214 | " Factory Mutual 1003-100 |
| Street Lamps 214 "Railway Spikes 637 "Washers, Crescent 1020 | Factory Nation |
| Washers, Crescent | " Pneumatic, Kewanee |
| Stretchers, Ressw. 1057 " Saw, Band. 1057 | Tan Drills Sizes of 696 69 |
| Strong Steam 1 Table | Gauges |
| Structural Rivets | " Wrenches |
| Stud Bolts | Tener Wire and Thickness Gauges Engineers' 85 |
| Studs, Belt | Tap Drills, Sizes of. 696, 69 "Gauges 85 "Wrenches. 785, 86 "Wrenches, Ratchet, Keystone 52 Taper, Wire and Thickness Gauges, Engineers's 85 Taper Arbors 71 Locomotive Reamers 71 "Mandrels, Morse 737, 73 "Pin Reamers 73 |
| Sucker Rod Couplings | Locomotive Reamers |
| Suction Hose | " Mandrels, Morse |
| " Pumps, Contractors' 989 | " Pin Reamers |
| Pumps, Cistern. 986 Pumps, Contractors' 989 Pumps, Disphragm 989 Supply System, Water, Kewanee 999 | Pins |
| Supply System, Water, Kewanee | " Reamers, Lightning |
| Supports, Flight, Conveyor | " Shank Straight Way Drilla 60 |
| " Ganera 860 | " Shank Twist Drills 686, 687, 702, 704, 70 |
| Picks 503 Surfaces 1092 | " Square Shank Twist Drills 69 |
| Surfacers | Taps, Blacksmiths' |
| Shapers, Saw. 1043, 1046 | Tapes, Measuring, Linen Corded |
| Surfacers 1092 Swage Blocks 545 "Shapers, Saw 1043, 1046 Swages, Bar 1048 "Blacksmithe" 542 "Saw, Disston 1041 "Saw, Hanchett 1043, 1044 "Saw White 1045 | Reamers, Roughing. 71. |
| " Blacksmiths' | Tapper Taps |
| ** Saw. Hanchett 1043 1044 | Tapper Taps. 76 Tapping Machines, Nut. Little Giant. 912, 91 Machines, Water Main 76 Taps, Bit Brace. 76 |
| | Taps, Bit Brace 76 |
| Swaging Hammers | " Boiler |
| Swamp Hooks | Boiler |
| Swartwout Exhaust Pipe Heads | " Nut 75 |
| " Check Valves, Brass, Lunkenheimer 71 | " Patch Bolt |
| ** Check Valves, Brass, P. & C | |
| " Check Valves, Iron Body, Extra Heavy 85 | " Screw, Machine |
| ** Check Valves, Iron Body, Extra Heavy 85 ** Check Valves, Iron Body, Hydraulic 85 | " Pulley 76 " Screw Machine 76 " Stay Bolt 76 " Stove Bolt 76 |
| " Check Valves, Iron Body, Jenkins Bros. 81 | " Stove Bolt |

xxxviii

THE CAMERON & BARKLEY CO.

| Page | Page |
|---|--|
| Taps, Taper, Blacksmiths' 764 Tapper 760 Tubing, Brazed Brass 764 Tar Melting Furnaces 516 | Tongs, Angle Jaw544 |
| " Tapper 760 | " Blacksmiths' |
| Tar Melting Furnaces 516 | " Band |
| Tarred Felt | " Clip |
| Tecktonius' Patent Hoop Lugs. 1009 Tees, Boiler, Circulating 253 | " Curved Lip543 |
| " Branch 960 I | " Gad |
| " Extragon 509 | " Lathe Tool |
| " Steel, Standard, Weight of 592 " Union, Malleable Iron 253 | " Dial- I'm 542 |
| Telephone Arms, Equipoise | Pipe, Chain, Champion. 789 Pipe, Chain, Trimo. 789 Pipe, Chain, Vulcan. 789 |
| Telephone Arms, Equipoise | " Pipe, Chain, Trimo |
| Telephones 1123 Telescope Screw Jacks, Duff 440 | Pipe, Chain, Vulcan |
| Tenoners 1095 Fents, Wall 1136 | " Rivet |
| Tents, Wall | " Round Jaw |
| Test Gauges 143 " Gauges, Inspectors' 143 " Indicators, Universal 859 | " Skidding |
| " Indicators, Universal 859 | Tongue and Groove Machines1110 |
| | Tongs, Straight Lip |
| "Gauge, American | " Handles |
| Thickness Gauges | " Handles. 511 " Holders, Armstrong. 824-829 " Repairs, Lumbering. 560 |
| Thimbles, Wire Rope | " Repairs, Lumbering |
| " Planimeters 145 | " Steel. Novo |
| Thread Calipers 850, 851 Threading Machines, Pipe, Armstrong 806, 807 " Machines, Pipe, Forbes Patent 808 | Steel, Novo 830 Steel Balls 832 Steel Classification 596 and Cutter Grinders, Dayton Universal 919 |
| " Machines Pipe Forbes Patent 808 | " Steel Classification |
| " Page 991 1 | Toolmakers' Clamps |
| " Tools, Armstrong | Toolmakers' Clamps |
| " Groove Chucking Resmers 722-725 | Tools, Beading |
| " Groove Twist Drills | " Blacksmiths' |
| Thresher Force Pumps | " Boring, Armstrong827, 829 |
| " Valves, Brass, Standard | " Orilling Well 1018 |
| " Valves, Iron Body, Lunkenheimer 87 | Surface Gauges |
| " Valves, Iron Body, Standard 87 | * HC10 ; Cum |
| " Valves, Lever, Brass, Lunkenheimer | " Unding 545 |
| Thumb Nuts 614 " Screws 614 | " Knurling, Armstrong828 |
| " Screws | " Lumbering |
| | " Moulders' 574-577 |
| Tight and Loose Pulleys Cast Iron Dodge 405 | Knurling |
| Tighteners, Belt, Dodge 431 Tiller Rope, Cast Steel 388 " Pope Jean 988 | " Saw, Crescent 1039 " Saw, Improved 1039 |
| 100pc, 110m | " Sawmakers' |
| Timber Grannles 569 | " Section 1011 |
| " Trucks | Side, Armstrong. 825, 826 Slotter, Armstrong. 829 Starrett's. 835-865 |
| Time Detectors, Watchman's, Newman 150 | " Starrett's |
| III, Dar | Threading, Armstrong 825 Track 523-526 Turning, Diamond 671 |
| " Block | " Turning, Diamond 671 |
| " Pig | Top Mauls |
| Tin Oilers | Top Maule |
| " Sash Cord 387 | " Inspectors' |
| Tinners' Burring Machines 877 | " Locomotive |
| " Circumference Rules | " Steel |
| " Snips | Towers, Steel |
| " Snips | Track Bolts |
| "Turning Machines 977 | " Chisels, Railroad |
| Stakes 878,879 Turning Machines 877 Wiring Machines 877 | man1070 |
| Tinning Brass Tubes | " Drills |
| Tips, Wiper. 193 Tire Bolts 620 | Gauges, riuntington |
| 193 193 | " Laving Cars |
| " Manganese Steel Chain | " Mauls, Railroad |
| Titus Drill Press Vises | " Ratchets, Railroad, Giant 591 |
| | " Scales, Railway |
| Toe Rings | " Spikes |
| Nails 639 Toe Rings 560 Toggle Irons 474 Toledo Adjustable Die Stocks 801-803 | " Wrenches, Railroad 523-526 |
| Toledo Adjustable Die Stocks 801-803 | Traction Belt Dressing, Dixon's |

THE CAMERON & BARKLEY CO.

xxxix

| Page | Page |
|--|--|
| Traction Engine Cylinder Cocks | Tucks Packing, Square. 11 Turbine Boiler Tube Cleaners 43 Turnbuckles. 626, 627 Turning Machines, Tinners' 877 11 Total Chines, Tinners' 871 |
| " Engine Gauges | Turbine Boiler Tube Cleaners43 |
| Wheels, Finished | Turnbuckles |
| Tranmel Points 855 | "Tools, Diamond |
| Trammel Points | Turnover Buckets 471 |
| " New | Turnover Buckets |
| Transfer Calipers852 | Twin Engine Steam Feeds |
| " Chain, Bevel Top339 | |
| " Chain, Detachable 328 " Chain Sprocket Wheels 345 | " Drill Sockets |
| Transmission, Power, Rope 378 | " Drille Constant Angle 706-700 |
| Transmission, Power, Rope | " Drills, Flat, Novo, High Speed710 |
| " Machinery, Dodge 395, 399-405, 407-410, | " Drills, Four Groove704, 705 |
| 412, 414-418, 426-429 | " Drills, Hollow |
| " Rope | Twist Coi Chain |
| Transportation Scales | |
| Trans. Steam. Cookson 165 | |
| Steam, Haines Improved 166 Steam, Nason 165 | Drills, Square Shank 684, 685, 688, 689, 703, 705, 707-709 Drills, Taper Shank 689, 702, 704, 706 Drills, Three Groove 702, 703 Drills, Wire Gauge 684 Two-Saw Trimmers, Dixie 1076 |
| " Steam, Nason | 689, 703, 705, 707–709 |
| " Steam, Reliance | " Drills, Taper Shank 686, 687, 702, 704, 706 |
| " Steam Strong 164 | " Drilla Wire Gauge 684 |
| Trench Braces | Two-Saw Trimmers, Dixie 1076 |
| Trench Braces. 517 Tribestos Covering. 20, 21 Trimmers, Two-Saw, Dixie 1076 | U |
| 1 rimmers, Two-Saw, Dixie | |
| " Wood, Oliver | U. S. Gauge, Actual Sizes of |
| Trimmers and Binders, Lath 1108 Trimmings, Tank, Pneumatic 1001 Trimo Chain Pipe Tongs 789 | " Injector Repairs |
| Trimo Chain Pipe Tongs789 | "Injectors |
| Pipe Cutters | " Hose Pipes |
| Triplex Blocks and Trolleys | Union Czar Drill Chucks |
| Pumps, Rumsey | Elbows, Malleable Iron |
| Tripeli Metal Polish 673 | " Scales 490 |
| Treatlere Reagn's 459 452 | " Tees Malleable Iron 253 |
| " Cast Iron452 | " Water Meters |
| ** Cast Iron | " Water Meters 168 Unions, Air Pump 254 " Brass, Finished 319 |
| " Steel 452 Troughing Carriers, Robins' 349 Trowels, Finishing 574 Truck Windlasses 464 Trucks 491, 492 | " Brass, Rough |
| Troughing Carriers, Robins' 349 | " Dart |
| Trowels, Finishing | " Clange Bross 391 |
| Truck Windlasses | Flange, Cast Iron 270 Flange, Cast Iron, Extra Heavy 275 Flange, Kewanee 270 |
| " Beg | " Flange, Cast Iron, Extra Heavy 275 |
| " Barrel | riange, Maileadie Iron |
| " Factory | " Jefferson |
| " Lumber | " Kewanee |
| " Steamboat | Malleagle Iron |
| * Store | " Malleable Iron, Extra Heavy |
| " Timber | " Standard |
| " Warehouse492 | Universal Revel Protractors 840 |
| Try Squares 842 Tube Cleaner Rods, Boiler 40 | " Bevels |
| " Cleaner Rods, Boiler | |
| " Cleaners, Boiler, Dean | " Double Tube Injectors, Korting 182 " Folders 881 |
| " Cutters44 | Measuring lapes |
| " Cutters, Glass | " Oil Pumps 201 |
| " Expanders | |
| Tubes Roller 226 | Post Hangers, Bond |
| " Brass Tinning 317 | " Surface Gauges |
| Tubes, Boiler 226 " Brass, Tinning 317 " Condenser, Brass 317 | " Test Indicators |
| Tubing | Vises, Emmert |
| " Beer | Upright Drills |
| " Brass, Cutting | Upsets, Saw, Disston |
| " Brazed | Upright First 301-363 Upsets, Saw, Disston 1041 Use-Em-Up Drill Sockets 679 Useful Information 1137-1143 |
| " Brazed, Cutting | 1.0 |
| " Copper316 | V |
| " Fibre | ▼ Crimped Roofing 605 Vacuum Gauges 140, 141 "Gauges, Recording, Bristol 148 "Gauges, Recording, Pittsburgh 149 "Burger, Feichpark, Morse 962 |
| " Rubber | vacuum Gauges |
| " Steel, Seamless, Shelby 298 | " Gauges, Recording, Dissorting, 149 |
| ** Steel, Seamless, Shelby | " Pumps, Fairbanks-Morse 962 |
| Tubular Gaskets, Red, Ideal | Pumps, Fairbanks-Morse 962 Regulating Valves, Kieley 120 Steam Flue Cleaners 42 |
| Gaskets, Semibronze | Steam Flue Cleaners |
| " Lanterns | Valbestine Packing |
| - women a secondary assumed a secondary assume | Taite Dails, Itaober |

| | Page | | | 'ag |
|----------|--|------|--|----------|
| Valve | Leathers, Pump 1012 Outlet Pipe, Improved 1008 | Valv | es, Drip | 193 |
| (| Outlet Pipe, Improved 1008 | | Flanged, Prices for Drilling | 307 |
| " 5 | Reseating Machines, Dexter 876 Springs | | Flap, Centrifugal Pump. Float, Davis. Float, Foster. | 128 |
| Valves | Air, Radiator 99 | | Float, Foster | 128 |
| | | 1 :: | Float. Lank | uit |
| | Angle, Brass, Clean Seat | 1 :: | Foot, Brass | 97 |
| 7 | Angle, Drass, Jenkins Dros | | Foot Iron Body | 97 |
| 7 | Angle, Brass, Jenkins Bros. 67 Angle, Brass, Lunkenheimer 69, 70 Angle, Brass, Needle Point 65 | | Foot, Emerson. Foot, Iron Body Foot, Centrifugal Pump | 979 |
| •• / | Angle, Brass, Safety 112 | 1 :: | Gate, Brass, Hose | -76 |
| ? | Angle, Brass, Standard | 1 :: | Gate, Brass, Jenkins | 77 |
| 7 | Angle, Iron Body, Extra Heavy 84 Angle, Iron Body, Jenkina Bros. 80 | | Gate. Brass. Pratt & Cadv | 77 |
| •• 7 | Angle, Iron Body, Lunkenheimer82, 86 | " | Gate, Brass, Lunkenheimer. Gate, Brass, Pratt & Cady. Gate, Brass, Quick Opening. Gate, Brass, Scott. Cate, Brass, Scott. | 76 |
| 4 | Angle, Iron Body, Safety 112 | 1 :: | Gate, Brass, Scott | 77 |
| 1 | Angle, Iron Body, Jenkins Bros. 80 Angle, Iron Body, Jenkins Bros. 80 Angle, Iron Body, Lunkenheimer 82, 86 Angle, Iron Body, Safety 112 Angle, Iron Body Standard 78 Back Pressure, Iron Body 129, 130 Back Pressure, Noiseless, Davis 129 Back Pressure and Exhaust Relief Crane 130 | | Gate, Brass, Standard | 76 91 |
| ··· i | Back Pressure, Noiseless, Davis 129 | | Gate, Iron Body, Extra Heavy 94 | . 95 |
| | | 1 :: | Gate, Iron Body, Extra Heavy. 94 Gate, Iron Body, Extra Heavy. 94 Gate, Iron Body, Jenkins. 91 Gate, Iron Body, Lunkenheimer. 91 Gate, Iron Body, Outside Screw and Yoke Gate, Iron Body Pratt & Cady. | 90 |
| 1 | Balanced, Davis | 1 :: | Gate, Iron Body, Lunkenheimer91 | , 92 |
| ; | Balanced, Mason | | Gate, Iron Body, Outside Screwand Toke | 90 |
| į | Blow-Off, Brass 109, 110 Blow-Off, Duro 111 Blow-Off, Iron Body 109-111 Brass, Clean Seat 27 | | Gate, Iron Body, Pratt & Cady | 93 |
| I | Blow-Off, Iron Body 109-111 | 1 :: | Gate, Iron Body, Standard88 | , 89 |
| 1 | Brass, Clean Seat | " | Gate, Lever, Brass, Handy, Lunkenhei- mer | 75 |
| i | Brass, Clean Seat | | Gate, Lever, Iron Body, Handy, Lunken- | |
| <u>I</u> | Brass, Pratt & Cady 68 | 1 | heimer | 87 |
| I | Brass, Regrinding, Lunkenheimer69, 71 | :: | Globe, Brass, Clean Seat | 72 |
| 1 | Brass, Renewo, Lunkenheimer | | Globe, Brass, Jenkins Bros | . 70 |
| ·· ĵ | Butterfly, Brass, Lunkenheimer 75 | | Globe, Brass, Needle Point | 6 |
| I | Butterfly, Brass, Lunkenheimer | " | Globe, Brass, Needle Point Globe, Brass, Standard Globe, Iron Body, Extra Heavy Globe, Iron Body, Jenkins Bros. | 65 |
| 1 | Butterfly, Iron Body, Lunkenheimer 87 Butterfly Iron Body, Standard 87 | " | Globe Iron Body, Extra Heavy | 80 |
| | Check, Brass, Angle, Jenkins Bros 68 | | Globe, Iron Body, Lunkenheimer82 | . 86 |
| (| Check Bress Angle Lunkenheimer 71 | | | |
| .: 9 | Check, Brass, Angle, Standard 66 Check, Brass, Ball, Lunkenheimer 71 Check, Brass, Ball, Standard 66 | | Hose, Brass Iron Body, Extra Heavy 84-86, 94 Iron Body, Jenkins Bros. 80, 81, Iron Body, Lunkenheimer 82, 83, 86, 91, Iron Body, Pratt & Cady | 74 |
| ، ، | Check, Brass, Ball, Standard 66 | | Iron Body, Jenkins Bros | . 90 |
| (| Check, Brass, Horizontal, Jenkins Bros. 68 | | Iron Body, Lunkenheimer 82, 83, 86, 91, | , 92 |
| " (| Check, Brass, Horizontal, Lunkenhei- | :: | Iron Body, Pratt & Cady81, | , 90 |
| " (| mer 71 Check, Brass, Horisontal, Standard 66 | | Iron Body, Lunkenheimer 82, 83, 86, 91, Iron Body, Pratt & Cady | . 89 |
| (| Check, Brass, Swing, Jenkins Bros 68 | | Navy, Brass, | 73 |
| 9 | Check, Brass, Swing, Lunkenheimer 71 | " | Outlet, Tank 10 | 010 |
| 8 | Check, Brass, Swing, P. & C | " | Reducing Davis | 110 |
| " ? | Check, Brass, Vertical, Jenkins Bros 68 | | Reducing, Fisher | 123 |
| " (| Check, Brass, Vertical, Lunkenheimer 71 | 1 :: | Reducing, Mason | 123 |
| 2 | Check, Brass, Vertical, Standard 66 | :: | | |
| } | Check, Hydraulic Gauge | | Regulating, Pressure, Davis | 119 |
| " (| Check, Iron Body, Angle Lunkenhei- | | Regulating, Pressure, Foster | 121 |
| | mer 83 | 1 :: | Regulating, Pressure, K and T | 122 |
| (| Check, Iron Body, Horizontal, Jenkins Bros | | Regulating Pressure Mueller | 124 |
| " (| Check, Iron Body, Horisontal, Lunken- | " | Reducing, Watson 124, Regulating, Pressure, Davis Regulating, Pressure, Foster Regulating, Pressure, K and T Regulating, Pressure, Kieley Regulating, Pressure, Mueller Regulating, Pressure, Perfection Relief, Crane Relief, Cylinder, Brass, American Relief, Hydraulic, American Relief, Water, Brass | 122 |
| | heimer 83 | 1 :: | Relief, Crane | 130 |
| } | Check Iron Body, Horizontal. Standard 79 Check, Iron Body, Swing, Extra Heavy 85 | | Relief, Cylinder, Brass, American | 114 |
| ن | Check, Iron Body, Swing, Hydraulic 85 | | Relief. Water. Brass | iii |
| (| Check, Iron Body, Swing, Jenkins Bros. 81 | 1 " | Relief, Water, Brass | 117 |
| ., (| Check, Iron Body, Swing, Lunkenhei- | :: | Safety, Brass. Safety, Iron Body. Safety, Low Pressure. | 112 |
| (| mer 83 Check, Iron Body, Swing, P & C 81 | | Safety Low Pressure | 112 |
| ·· è | Check, Iron Body, Swing, Standard 79 | | Safety, Pop. Brass, American | iii |
| • • • | Check, Iron Body, Vertical, Jenkins | " | Safety, Pop. Brass, American. Safety, Pop. Bross, American. Sight Feed. Sight Feed. Sinifting, Brass, American. Tank. 1. The state Development of the state of t | 114 |
| | Bros. 81 Check, Iron Body, Vertical, Standard 79 Check, Tank 1010 | | Sight Feed | 193 |
| ، ، | Check, Tank 1010 | | Tank | 010 |
| | | " | Throttle, Brass, Lunkenheimer | 7 |
| 5 | Cross, Brass, Jenkins Bros. 67 Cross, Brass, Lunkenheimer 69, 70 | ** | Throttle, Brass, Standard | 7 |
| 6 | ross, Brass, Lunkenheimer69, 70 | :: | Throttle, Lever, Brass, Lunkenheimer | 71 |
| 5 | Cross, Brass, Safety 112 Cross, Brass, Standard 65 | | Throttle, Brass, Lunkenheimer Throttle, Brass, Standard Throttle, Lever, Brass, Lunkenheimer Throttle, Lever, Iron Body, Lunkenheimer Throttle, Iron Body, Standard Throttle, Iron Body, Lunkenheimer Water Relief Brass | 87 |
| | FOSS, Iron Body, Jenkins Bros | " | Throttle, Iron Body, Lunkenheimer | 87 |
| .: 9 | Cross, Iron Body, Lunkenheimer82, 86 | " | Water Relief, Brass | 118 |
| " 6 | Cross, Iron Body, Lunkenheimer | " | Whistle | 150 |
| | | | | |

| Page | Page |
|---|---|
| Veneer Cutting Machinery1101, 1102 | Water Column Bodies 154 " Columns Safety, Pittsburgh 156 " Columns Safety, Paliance 155 |
| " Knives. 1035, 1036 " Saws. 1102 | "Columns, Safety, Pittsburgh 156 |
| " Saws1102 | Columns, Safety, Reliance |
| Ventilators, Burt | " Gauges, Self-Cleaning |
| " Check Valves, Brass, Lunkenheimer 71 | " Heaters, Feed, Cochrane |
| " Check Valves, Brass, Standard 66 | " Heaters Reed Erie City 170, 171 |
| " Check Valves, Iron Body, Jenkins Bros. 81 | " Heaters, Feed, Hoppes |
| " Check Valves, Iron Body, Standard 79 | " Hose |
| Shart Dearings, Douge420, 420 | in Pipes, Friction of |
| " Shaft Clamp Boxes, Bond | " Main Tanning Machines 513 |
| Vibro Covering | Main Tapping Machines 513 Meters, King 168 Meters, Ning 167 |
| Victor Glass Oil Cups | " Meters, Niagara 167 |
| " Iron Body Gate Valves 92 | " Meters, Union 168 |
| Vise Stands, Portable 833 Stands, Stationary 833 | Meters, Worthington |
| Vises, Blacksmiths' | Meters, Kingara 167 |
| " Blake | " Pressure Gauges |
| " Box. Solid | " Relief Valves, Brass |
| " Bull Dog | " Relief Valves, Iron Body |
| " Drill, Quick Action, Armstrong | Supply System, Kewanee |
| " Filers' | " Tool Grinders, Bench |
| " Finishers' | " Working Pressures Proportionate 218 |
| " Leg. Fisher | " and Steam Gauges, Combination 154 |
| " Machinista' 811.812.815 | Waterproof Crayons |
| " Milling Machine | " Hydraulic Ring Packing, Improved 3 " Leather Belting, Neptune |
| " Parker | Waters Compound Regulators |
| " Patternmakers' 815 | " Pump Governors |
| ** Din 985 | " Pump Governors 133 Watson Pump Governors 132 |
| " Pipe, Combination 813 " Pipe, Combination, Reed's 810 " Pipe, Henderer 810 | " Reducing Valves 124, 126 Wearless Chain, Tisco 372 Weatherproof Siding 606 |
| Pipe, Combination, Reed's | Wearless Chain, Tisco |
| "Pine Jaracki XI() | Web Saws Felloe 1032 |
| Prentiss. 811-813 Press, Drill. 774 Universal, Emmert. 815 | Web Saws, Felloe 1032 Wedges, Adjustable, Cast Iron 271 564 564 |
| " Press, Drill | OB.W |
| Universal, Emmert | |
| " Vulcan | Weight of Flat Iron 588 |
| " Woodworkers' 812, 818 Vixen Hand Milling Tools 663 | "Wood Choppers" 566 Weight of Flat Iron 588 " of Flat Rolled Steel Bars 589, 590 |
| Vogper Fipe Cutters | " of Round Iron |
| Vulcan Anvils | of Kound Steel |
| " Chain Pipe Tongs | " of Sheet Iron per Square Foot 584 " of Sheet Steel per Square Foot 584 |
| " Sight Feed Lubricators | |
| Drop Forged Lathe Dogs 823 Sight Feed Lubricators 198 Vises 814 | of Square Steel |
| w | of Standard Channels |
| WAGON Scales | " of Standard Steel Tees 592 |
| " Winches | " of Steel Rails per Mile |
| Wagons, Dumping | Weights, Tables of |
| Walker Hose Clamps 53 Walker's Oil Pumps 210 | |
| Wall Brackets, Extension, Dodge | " Points Drive Bress Jacket 1014 |
| " Hydrants and Washers, Star | Drilling Tools |
| " Tents | " Lathe Chucks |
| Warehouse Brooms | Weston Belt Clamps |
| * Hose Reels | Wheel Guards and Track Cleaners Patent Zim- |
| ** T | merman 1070 |
| Warmers, Glue 675,676 Warmers Brass Pipe Wrenches 788 Washer Cutters 37 | " Presses, Hydraulic 890 |
| Warnock Brass Pipe Wrenches | " Scrapers |
| Washer Cutters | Wheelbarrows 487–490 Wheelbarrows Scales 495 |
| Washers, Cast Iron | Wheels Ruff 674 |
| " Cork 191 | " Bull. 467 " Car, Chilled. 540 |
| " Glass, Gauge | " Car, Chilled |
| ** Hose, Rubber | |
| " Malleable Iron | " Emery |
| M Gt. 1 | Darbot Hotel 1090 |
| " Street, Crescent | " Polishing |
| " Wrought Iron | " Sprocket |
| Steel | " Sprocket, Detachable Link Chain 340-343 " Sprocket, Ley Bushed Chain 344 |
| | " Sprocket Malleable Roller Bushed Chain 346 |
| Waste Cans, Oily 211 Watchman's Clocks, Newman 150 | " Sprocket, Riveted Sawdust Chain 345 " Sprocket, Transfer Chain 345 |
| Watchman's Clocks, Newman | " Sprocket, Transfer Chain |

| Page | |
|--|--|
| Wheels, Traction, Ley Bushed Chain 347 | Wood Rod Couplings |
| Whistle Valves | " Saws, Cord |
| Whistles, Chime | " Snatch Blocks |
| " Gong, Iron | " Split Pulleys, Dodge |
| Gong, 1701 | Split Fulleys, Douge |
| " Steam | " Splitting Machines |
| White Lead | Stave Ash Caus |
| " Saw Swages | I ackie Diocks |
| Sheet Packing, Magnolia | |
| Star Oil Filters | " Trimmers, Oliver |
| Whitened Wire, Brass 647 | Woodworkers, Combination, C |
| Whitened Wire, Brass | "Trimmers, Oliver Woodworkers, Combination, C Woodworkers' Vises |
| Whitney Hand Metal Punches 549 | Woodworking Machinery |
| Wick Oiling Pillow Blocks, Dodge 418 | Wool, Mineral |
| " Packing, Asbestos 17 | Wool Waste |
| Wicking, Candle | Working Heads, Power |
| Wiedeke Self Feed Tube Cutters 44 | Worthington Oil Meters |
| " Self Feed Tube Expanders 44 | " Water Meters |
| Willey Generators1117, 1118 | Woven Belting, Cotton |
| " Motors | Wrecking Chains |
| Wilson Track Drills | Wrecking Chains |
| Wison Track Drins | Wrenches, Alligator |
| Winches, Derrick | " Always Ready |
| " Hoisting461-463 | Auto-Cle |
| " Wagon 464 | " Automobile |
| "Wagon 464 Windlasses, Truck 464 | " Automobile " Bemis and Call |
| Wiper Cups 193 | " Carriagemakers' |
| Tips | " Cock, Steam |
| Wiping Solder | " Coes |
| Wire, Brass 647 | " Engineers' |
| " Bundling | " General Service |
| " Cast Steel | " Knife Handle |
| " Copper 647 | |
| " Fores 849 840 | " Monkey |
| rence | ripe, brass, nayden |
| Market | ripe, rarmeiee |
| Steel, Smooth | ribe, Stillson |
| | "Reamer |
| Straightening and Cutting of 048 | " Reamer " S, Adjustable, Westcott. |
| " Cloth, Brass | S. Concave Handle |
| " Cloth, Coal Screen 597 | " S, Flat Handle |
| " Cloth. Copper | " Set Screw |
| " Cutters and Pliers, Combination 874 | " Socket |
| " Gauge Standards 650 | " Socket, Giant |
| " Gauge Straight Way Drills 695 | " Socket, Ratchet, Keystor |
| " Gauge Twist Drills 684 | " Steel |
| " Gauge Twist Drills in Sets 699 | " Tap |
| " Gauges | " Tap, Ratchet, Keystone. |
| " Maila Gaad #20 | " Tap, Natchet, Reystone. |
| " Nails, Steel | " Track, Railroad |
| " Rope | Wright's Non-Friction Band Se |
| " Rope, Galvanized Iron 387 " Rope, Splicing 388 | Wrought Iron Clips |
| " Rope, Splicing | " Iron Couplings |
| " Rope Clamps 389 | Iron Gin Diocks |
| " Rope Clamps 389 " Rope Clips 389 " Rope Fastenings 389-391 | " Iron Nipples |
| " Rope Fastenings | " Iron Pipe |
| Rope Feed Attachments | " Iron Turnbuckles |
| " Rope Hooks and Sockets 391 | " Iron Washers |
| " Rope Hooks and Thimbles 390 | " Steel Pipe |
| " Rope Sheaves | |
| " Rope Snatch Blocks | X |
| " Rope Sockets | X-L-All Concrete Mixers |
| " Rope Tackle Blocks | and and concrete biliters |
| " Dana Thimbles 200 | Y |
| Rope Immbles | _ - |
| Soiger | Yankee Spring Dividers |
| SDIKES, Steel | " Drill Grinders |
| Strand, Steel, Galvanized | " Spring Calipers |
| " Winding of Hose 47 | Yankees, Moulders' |
| Wiring Machines, Tinners' 877 | Yarn, Lath, Sisal |
| "Winding of Hose | _ |
| Wood Choppers' Wedges | Z |
| " Cutters | Zimmerman Patent Wheel-Gu |
| " Files | Cleaners |
| " Fillets | Zinc |
| " Rasps | Zincs, Battery |
| | |

| " Split Pullage Dodge | 20.5 |
|---|---|
| Snatch Blocks Split Pulleys, Dodge Splitting Machines Stave Ash Cans Tackle Blocks | |
| Splitting Machines | 11111 |
| " Stave Ash Cans | 211 |
| " Tackle Blocks | 442 |
| " Tanks | . 1003-1007 |
| " Trimmers, Oliver | 1116 |
| Woodworkers, Combination, Crain | 1115 |
| Woodworkers' Vises | 812.818 |
| Tanks. "Trimmers, Oliver Woodworkers, Combination, Crain Woodworkers Vises. Woodworking Machinery | 1091-1100 |
| Wool, Mineral Wool Waste Working Heads, Power Worthington Oil Meters | 18 |
| Wool Waste | 10 |
| Working Honds Power | 081 |
| Worthington Oil Motors | 160 |
| worthington Oil Meters | 109 |
| "Water Meters Woven Belting, Cotton Wrecking Chains Wrenches, Allgator "Always Ready "Auto-Cle "Automobile "Bemis and Call "Carriagemakers' "Cock, Steam "Coes "Engineers' "General Service. | 109 |
| Woven Belting, Cotton | 30 |
| Wrecking Chains | 381 |
| Wrenches, Alligator | 787 |
| " Always Ready | 787 |
| " Auto-Cle | 787 |
| " Automobile | 795 |
| " Pamis and Call | 798 |
| " Carriagemellers! | 705 |
| U C CA | 183 |
| Cock, Steam | 100 |
| Coes | 786 |
| " Engineers' | 790, 7 91 |
| " General Service | 795 |
| " Engineers' | 786 |
| " Monkey | 786 |
| " Pine Brass Hayden | 788 |
| " Pine Permelee | 788 |
| General Service. Kuife Handle. Monkey. Pipe, Brass, Hayden. Pipe, Parmelee. Pipe, Stillson. | 786 |
| " Decree | 714 705 |
| reamer | / 14, /65 |
| S, Adjustable, Westcott | 181 |
| Pipe, Parmelee Pipe, Stillson Reamer S, Adjustable, Westcott S, Concave Handle | 792 |
| "S. Flat Handle | 703 704 |
| | 100, 104 |
| " Set Screw | 798 |
| Set Screw | |
| | |
| | |
| | |
| | |
| | |
| " Socket, Giant Socket, Ratchet, Keystone Steel Tap. Patchet Koystone | 796, 797 521 519 786 785, 862 |
| " Socket, Giant Socket, Ratchet, Keystone Steel Tap. Patchet Koystone | 796, 797 521 519 786 785, 862 |
| " Socket, Giant Socket, Ratchet, Keystone Steel Tap. Patchet Koystone | 796, 797 521 519 786 785, 862 |
| " Socket, Giant Socket, Ratchet, Keystone Steel Tap. Patchet Koystone | 796, 797 521 519 786 785, 862 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| " Socket. " Socket, Giant. " Socket, Ratchet, Keystone. " Steel. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. | 796, 797 519 785, 862 521 526 es1050 |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. Steel. "Tap, "Tap, Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. | 796, 797 519 785, 862 521 526 es1050 |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. "Tap. "Tap, Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. Steel. "Tap, "Tap, Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. | |
| "Socket. "Socket, Giant. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap, "Tap, Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Gin Blocks. "Iron Pipe. "Iron Turnbuckles. "Iron Turnbuckles. "Steel Pipe. X X-L-All Concrete Mixers. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. "Tap., Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Gouplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. "Tap., Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Gouplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. Y Yankee Spring Dividers. "Drill Grinders. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. Y Yankee Spring Dividers. "Drill Grinders. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. Y Yankee Spring Dividers. "Drill Grinders. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. Y Yankee Spring Dividers. "Drill Grinders. | |
| "Socket. "Socket, Giant. "Socket, Ratchet, Keystone. "Steel. "Tap. "Tap., Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Gouplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. | |
| "Socket. "Socket, Giant. "Socket, Giant. "Socket, Ratchet, Keystone. Steel. "Tap. "Tap, Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. Yankee Spring Dividers. "Drill Grinders. "Spring Calipers. Yankees, Moulders' Yarn, Lath, Sisal. | |
| "Socket. "Socket, Giant. "Socket, Giant. "Socket, Ratchet, Keystone. "Tap. Tap. Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Gouplings. "Iron Gin Blocks. "Iron Nipples. "Iron Pipe. "Iron Turnbuckles. "Iron Washers. "Steel Pipe. X X-L-All Concrete Mixers. Yankee Spring Dividers. "Drill Grinders. "Spring Calipers. Yankees, Moulders. Yarn, Lath, Sisal. | |
| " Socket. " Socket, Giant. " Socket, Giant. " Socket, Ratchet, Keystone. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. " Iron Gouplings. " Iron Gin Blocks. " Iron Nipples. " Iron Pipe. " Iron Pipe. " Iron Washers. " Steel Pipe. X X-L-All Concrete Mixers. " Steel Pipe. " Spring Calipers. Yankees, Moulders' Yarn, Lath, Sisal. Z Zimmerman Patent Wheel-Guards and | |
| "Socket. "Socket, Giant. "Socket, Giant. "Socket, Ratchet, Keystone. "Tap. Tap. Ratchet, Keystone. "Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. "Iron Couplings. "Iron Gin Blocks. "Iron Nipples. "Iron Turnbuckles. "Iron Turnbuckles. "Iron Twhuckles. "Steel Pipe. X X-L-All Concrete Mixers. "Yankee Spring Dividers. "Drill Grinders. "Spring Calipers. Yankees, Moulders' Yarn, Lath, Sisal. Z Zimmerman Patent Wheel-Guards and Cleaners. | |
| " Socket. " Socket, Giant. " Socket, Giant. " Socket, Ratchet, Keystone. " Tap. " Tap, Ratchet, Keystone. " Track, Railroad. Wright's Non-Friction Band Saw Guide Wrought Iron Clips. " Iron Gouplings. " Iron Gin Blocks. " Iron Nipples. " Iron Pipe. " Iron Pipe. " Iron Washers. " Steel Pipe. X X-L-All Concrete Mixers. " Steel Pipe. " Spring Calipers. Yankees, Moulders' Yarn, Lath, Sisal. Z Zimmerman Patent Wheel-Guards and | |

Page

INDEX TO FIGURE NUMBERS

The illustrations in this catalogue are grouped by pages. All the illustrations on a given page are designated by the same number, being distinguished from each other by the addition of different letters.

To locate any figure, ignore the letter, and find the figure number in the first column. The page number will be opposite.

Thus, to give Fig. 429B, merely look up 429 which is to be seen on page 720.

| Fig. No. Page | | l n v n | Fig. No. Page | Fig. No. Page |
|-----------------------|------------------------|----------------------------------|----------------------|----------------------|
| Fig. No. Page 1219 | Fig. No. Page | Fig. No. Page | Fig. No. Page 716275 | Fig. No. Page 882198 |
| 4367 | 203 605 204 136 | 458611 | 721274 | 883198 |
| 6347 | | 461614 | 722277 | 891207 |
| 14236 | 217642 241344 | 470628 481645 | 723278 | 892208 |
| 18297 | 241 891 | 487818 | 725288 | 907 210 |
| 21269 | 260582 | 501 486 | 726290 | 924516 |
| 22302 | 275332 | 519754 | 732319 | 92840 |
| 23303 | 282751 | 520711 | 733320 | 92942 |
| 24282 | 286752 | 521351 | 734321 | 940 62 |
| 25283 | 287750 | 522369 | 73565 | 94252 |
| 26284 | 288741 | 523362 | 73966 | 94555 |
| $27 \dots 285$ | 296301 | 52599 | 74071 | 94658 |
| 28286 | 297 35 | 539755 | 74268 | 94859 |
| 29287 | 306886 | 542756 | 748441 | 954978 |
| 30 291 | 3091123 | 572162 | 74978 | 956977 |
| 31292 | 31184 | 573630 | 756107 | 959308 |
| 35492 | 3141116 | 575334 | 757106 | 96219 |
| 36295 | 317543 | 582547 | 758108 | 96830 |
| 37296 | 318544 | 588453 | 76179 | 10161014 |
| 38298 | 319450 | 593710 | 76381 | 1022436 |
| 39299 | 320542 | 607743 | 76697 | 1026438 |
| 45240 73694 | 327744 | 608753 | 77389 | 1030514 |
| 74730 | 328749 329348 | 613550 621101 | 77593 | 1032647 |
| 86345 | 330722 | $621 \dots 101 \\ 622 \dots 439$ | 784117 | 1040 147 |
| 92289 | 332217 | 627 540 | 785137 | 1042586 |
| 103430 | 3391010 | 638866 | 787100 | 1042585 |
| 104 | 345337 | 6421092 | 789102 | 1064989 |
| 110733 | 367338 | 649179 | 795157 | 1075148 |
| 121 335 | 368339 | 651551 | 801160 | 1087999 |
| 125346 | 496526 | 655209 | 812105 | 1096377 |
| 131 704 | 417702 | 663682 | 813801 | 1097378 |
| 147 719 | 420684 | 664718 | 814176 | 110641 |
| 153 742 | 423735 | 678725 | 815183 | 1107340 |
| 154 745 | 424707 | 681706 | 827 134 | 1117350 |
| 155 732 | 425703 | 682724 | 839161 | 1120355 |
| 156998 | 426705 | 683723 | 842175 | 1123353 |
| 159746 | 427714 | 685222 | 851223 | 1124356 |
| 160747 | 429720 | 687248 | 855189 | 1127358 |
| 164820 | 430691 | 688249 | 859191 | 1129359 |
| 180392 | 433920 | 690251 | 861190 | 1131364 |
| 185609 | 434674 443478 | 691252 | 864200 | 1139140 1140142 |
| 187616 188618 | 443478 | 692253 710 309 | 865194 866193 | 1140142 |
| 193620 | 451821 | 712319 | 800193 | 1143631 |
| 193020 | g 1 00494 | 112310 | II 001199 | 1 1149091 |

xliii

| xliv | THE CAME | RON & BA | RKLEY CO. | |
|------------------------|------------------------|------------------------------------|-----------------------------|------------------------------------|
| Fig. No. Page | Fig. No. Page | Fig. No. Page | Fig. No. Page | Fig. No. Page |
| 1145632 | 170647 | 20951087 | 271928 | 3816138 |
| 1146 634 1148 623 | 171048 1713460 | 2115987 2116983 | 2774500 2775501 | 3821276 3826363 |
| 1150625 | 1714459 | 21171016 | 2798465 | 3884330 |
| 1151610 | 1715458 | 21181015 | 2799466 | 3911 1132 |
| 1186766 | 1716455 | 21191107 | 2800 467 | 3953225 |
| 1191354 | 1736457 | 2120 1106 | 2801468 | 3963229 |
| 1193 573 1198 520 | 1737639 1806531 | 2121 1104 2122 1105 | 2802469 | 3965912 3994264 |
| 1203 887 | 1846370 | 2123888 | 2803470 2811474 | 3995265 |
| 1237546 | 1895360 | 2124 603 | 2820583 | 3997267 |
| 1243523 | 1897678 | 2125233 | 2862513 | 3998266 |
| 1250 502 | 1904 213 | 2126232 | 28681023 | 4038440 |
| 1278329 | 1905456 | 2128169 | 2883826 | 4048824 |
| 1294 633 1295 638 | 1906 449 1924 373 | 2129 139 2130 1017 | 2921 799 2923 150 | 4105 789 4121503 |
| 1297548 | 2001352 | 213127 | 2982798 | 41511040 |
| 12991056 | 2035961 | 213261 | 2983790 | 4181600 |
| 13061022 | 2036962 | 21331130 | 2984 791 | 4197497 |
| 13101029 | 2037964 | 21341021 | 2986823 | 420694 |
| 13121030 | 2039963 | 2135133 | 3133154 | 4216125 |
| 13221055 13231054 | 2040 959 2052 372 | 21371101 21381102 | 3144 156 3163 221 | 4241204 4252496 |
| 13261058 | 2054 480 | 2153770 | 319129 | 4325992 |
| 1327 1059 | 2055982 | 2155777 | 3206152 | 43381019 |
| 13281060 | 2056490 | 2223 365 | 3278607 | 434218 |
| 13321047 | 2057537 | 2226665 | 3279606 | 435517 |
| 1338 1044 1350 1051 | 2058810 | 224450 | 3284587 | 4375677 4377270 |
| 13511052 | 2059 51 2060 144 | $2269 \dots 892$ $2270 \dots 893$ | 3356 1089 3395804 | 4394629 |
| 1374536 | 2061385 | 22811129 | 3402508 | 44131020 |
| 1375475 | 2062384 | 2283128 | 3408376 | 4419986 |
| 1376476 | 2063383 | 2286206 | 3415226 | 4420984 |
| 1380507 | 2064931 | 2368580 | 341667 | 4492111 |
| 1395567 1397561 | 2065932 2066933 | 2385322 2389328 | 3435393 3485917 | 4553 242 4554 243 |
| 1398559 | 2067934 | 2394 1097 | 3487918 | 4565993 |
| 1399560 | 2068935 | 2395 1094 | 34891063 | 4623815 |
| 1404380 | 2069936 | 23971095 | 3498491 | 4673553 |
| 1405381 | 2070937 | 239991 | 3536562 | 4674554 |
| 1408382 1411388 | 2071938 2072939 | 2408 827 2411 850 | 35461131 35541119 | 4676555 4690946 |
| 1413389 | 2073941 | 2412851 | 3566604 | 4743 431 |
| 1414390 | 2074940 | 2413852 | 3578601 | 478882 |
| 1415391 | 2076571 | 2448857 | 3608 949 | 479073 |
| 1422442 | 20791127 | 2489780 | 3611805 | 479277 |
| 1427 446 | 2080 1128 | 2501 662 | 3640259 | 4796114 |
| 1434451 1448361 | 20811064 20821066 | 2503641 2508868 | 366323 7 367596 | 4803 188 4805 178 |
| 14571133 | 20831065 | 25961041 | 3692235 | 4807118 |
| 1471985 | 20841074 | 2600 1061 | 3705324 | 4809115 |
| 1518 1136 | 20851073 | 26131062 | 3706272 | 4810254 |
| 1633564 | 20861071 | 2672792 | 37081126 | 4812268 |
| 1634651 | 20871078 | 2676796 | 3716997 | 4816185 |
| 1635652 1636653 | 2088 1077 2089 1082 | 2677797 2678822 | 371815 3736923 | 4817184 4819177 |
| 1637654 | 2090 1082 | 2679832 | 3740927 | 4821180 |
| 1638655 | 20911079 | 2683825 | 3742 926 | 4825250 |
| 1652566 | 20921080 | 2684828 | 3743928 | 4827 315 |
| 170345 | 20931084 | 26951096 | 3789234 | 482883 |
| 170546 | ∥ 20941086 | 2714 979 | 3802 85 | 4830112 |

| | THE | CAME | RON | & | BA | RKLEY | CO. | xlv |
|-------------------------------|----------------|------|----------------|---------|-------|--------------|--------|---------------------|
| Fig. No. Page | Fig. No. | | Fig. No. | | Page | Fig. No. | Page | Fig. No. Page |
| 4832316 | | 53 | 5719 | | .873 | 6015 | . 896 | 6346574 |
| 483380 | | 443 | 5722 | | | 6016 | 897 | 6355778 |
| 483676 4838255 | | 643 | 5727 | | .522 | 6020 | | 6356795 |
| 483916 | | 622 | 5728 | | | 6035 | | 6357576 |
| 4844 109 | | 875 | 5741 5742 | | | 6059 | | 6391929 6397668 |
| 4845 201 | | 231 | 5743 | | | 6088 | | 6424 577 |
| 4846 165 | | 675 | 5744 | | | 6115 | | 6460575 |
| 4858312 | 5600 | 676 | 5755 | | | 6116 | | 6467485 |
| 4860 313 | | 256 | 5760 | | | 6117 | . 1114 | 649495 |
| 4861 311 | | 257 | 5778 | | | 6123 | | 6538 617 |
| 4871 119 4873 123 | | 969 | 5779 | | | 6125 | | 6545782 |
| 4874126 | | 788 | 5780 | | | 6126 | | 6546781 |
| 4875121 | | 1013 | 5796 5797 | · · · · | 700 | 6127 | | 6547783 |
| 4886 129 | | 563 | 5810 | | 767 | 6135 6136 | | 6548599 661439 |
| 4887130 | | 874 | 5815 | | | 6144 | | 6625407 |
| 4888127 | | 615 | 5817 | | | 6151 | | 6626408 |
| 4913945 | 5634 | 626 | 5821 | | | 6152 | | 6635131 |
| 4914368 | | 3 | 5822 | | . 944 | 6168 | | 663943 |
| 4915948 | | 835 | 5835 | | | 6205 | | 664563 |
| 4966164 | | 837 | 5844 | | | 6212 | | 6649530 |
| 499511 | | 836 | 5846 | | | 6228 | | 6690913 |
| 5061 541 5076 9 | | 838 | 5854 | | | 6229 | | 6692845 |
| 5077 432 | | 842 | 5855 5859 | | | 6232 | | 6693846 6694844 |
| 50858 | | 843 | 5860 | | | 6256 | | 6699921 |
| 5088484 | | 840 | 5861 | | | 6257 | | 6717205 |
| 51106 | | 841 | 5862 | | | 6263 | | 6718168 |
| 5143947 | 5646 | 847 | 5863 | | | 6264 | | 6727867 |
| 5147973 | | 849 | 5864 | | | 6265 | 715 | 6730 698 |
| 515098 | | 848 | 5865 | | | 6266 | | 6732943 |
| 51561011 51687 | | 853 | 5873 | | | 6267 | | 6738972 |
| 51711008 | | 854 | 5884 5886 | | | 6268 | | 6752915 |
| 5186271 | | 856 | 5887 | | 1000 | 6269 6270 | | 6762884 67702 |
| 5188122 | | 858 | 5889 | | | 6271 | | 67851068 |
| 5222 1046 | | 859 | 5910 | | | 6272 | | 6830 300 |
| 5295 819 | | 860 | 5912 | | | 6273 | | 6831304 |
| 5305 323 | | 863 | 5916 | | | 6274 | | 6833974 |
| 5310495 | | 864 | 5934 | | | 6275 | | 6835104 |
| 5314525 | | 865 | 5935 | | | 6276 | | 6839187 |
| 5322 | | 764 | 5963 | | | 6277 | | 68441069 |
| 5338 482 | | 762 | 5966 5968 | | | 6278 6279 | | 684664 |
| 5369 | | 521 | 5971 | | | 6280 | | 6850396 |
| 5370956 | | 519 | 5973 | | | 6281 | | 6853318 |
| 5371955 | | 510 | 5976 | | | 6301 | | 68811088 |
| 5373 958 | 5686 | 578 | 5977 | | | 6302 | | 6897994 |
| 5451 539 | | 493 | 5990 | | . 570 | 6303 | 701 | 6918 1124 |
| 5485517 | | 870 | 5997 | | | 6304 | | 6924 305 |
| 5508 57 | | 800 | 5998 | | | 6305 | | 6925293 |
| 5524 452 | 5705 | | 5999 | | .899 | 6306 | | 6926557 |
| 5528186 5531556 | 5707 | 773 | 6001 | | .900 | 6307 | | 6927 552 |
| 5547196 | 5710 | | 6002 | | .901 | 6314 6328 | | 6954 227 6956 69 |
| 5551871 | 5712 | | 6005 | | | 6337 | | 6958314 |
| 5555 621 | | 802 | 6011 | | | 6338 | | 69601001 |
| 5562 624 | 5714 | | 6012 | | .908 | | 793 | 69851120 |
| 5564613 | 5716 | 527 | 6013 | | .894 | 6343 | . 794 | 69861121 |
| 5565656 | jj 5718 | 581 | 6014 | | .895 | 6345 | . 831 | 7019 167 |

| xlvi | · · | THE | CAME | RON | & BA | RKLEY CO. | • |
|----------|---------|---------|--------|----------|------|-----------------|------------------|
| Fig. No. | Page | Fig. No | . Page | Fig. No. | Page | Fig. No. Page | Fig. No. Page |
| 7035 | 143 | 7408 | 690 | 7891 | 20 | 8584349 | 9348149 |
| 7051 | 54 | 7409 | 737 | 7902 | 506 | 8589950 | 9351203 |
| 7060 | 489 | 7413 | 968 | | 172 | 85911033 | 9356427 |
| 7067 | 1053 | 7425 | 336 | 7934 | 145 | 85921034 | 93611117 |
| 7070 | 1050 | 7427 | 811 | 7956 | 146 | 861831 | 93621118 |
| 7072 | 1035 | 7428 | 812 | 7987 | 829 | 8640990 | 9389813 |
| 7080 | 518 | | 5 | | 644 | 8641991 | 9400 980 |
| 7081 | 649 | 7453 | 1090 | 8004 | 1081 | 86431012 | 9430481 |
| 7082 | 784 | | 181 | 8013 | 1109 | 8693786 | 94681093 |
| 7083 | 533 | 7473 | 648 | 8014 | 1134 | 8710 120 | 9484 602 |
| 7089 | 56 | 7516. | 33 | 8015 | 1108 | 87681125 | 94971115 |
| 7098 | 447 | 7529 | 1032 | | 1111 | 877375 | 9498885 |
| 7102 | | | 814 | 8019 | 1110 | 8796975 | 950726 |
| 7103 | | | 1070 | 8024 | 1072 | 8798809 | 950825 |
| 7104 | | 7549. | 113 | 8028 | 1113 | 87991135 | 9510406 |
| 7111 | | | 748 | | 197 | 88031112 | 9511477 |
| 7133 | | | 761 | | 419 | 8865357 | 9542532 |
| 7134 | | | 23 | | 422 | 8951 499 | 95441067 |
| 7140 | | | 1048 | | 424 | 8952515 | 9545925 |
| 7141 | | | 37 | | 425 | 8979804 | 9546924 |
| 7142 | | | 637 | | 423 | 89801039 | 9547930 |
| 7154 | | | 74 | | 411 | 8990214 | 95481091 |
| 7173 | | | 953 | | 413 | 9070995 | 95591018 |
| 7178 | | | 759 | | 721 | 9072166 | 9599558 |
| 7185 | | | 760 | | 740 | 9079739 | 9600 966 |
| 7194 | | | 660 | | 608 | 9081163 | 96021045 |
| 7200 | | | 816 | | 612 | 908272 | 9603435 |
| 7242 | | | 636 | | 988 | 9113399 | 9604 434 |
| 7247 | | | 669 | | 619 | 9115412 | 9686967 |
| 7256 | | | 238 | | 215 | 9116410 | 9687426 |
| 7257 | | | 239 | | 110 | 9117414 | 9688428 |
| 7258 | | | 34 | | 970 | 9118415 | 9689429 |
| 7259 | 720 | | 86 | | 1085 | 9119416 | 9711116 |
| 7261 | | | 158 | | 996 | 9120417 | 9714976 |
| 7281 | | | 1042 | | 483 | 9121418 | 9823 1024 |
| 7282 | | | 445 | | 212 | 9131258 | 98281027 |
| 7290 | | | 569 | | 876 | 9132273 | 9879922 |
| 7293 | | | 1038 | | 103 | 91331103 | 9887763 |
| 7301 | | 7777 | 1009 | | 498 | 9141504 | 9898775 |
| 7336 | | | 635 | | 87 | 91421076 | 9902646 |
| 7348 | 20 1049 | | 44 | | 124 | 91431075 | 9934487 |
| 7365 | 275 | | 1122 | | 664 | 9304 670 | 9965776 |
| 7366 | 190 | | 159 | | 36 | 932213 | 220 2 |
| 7402 | | | 32 | | 942 | 932314 | |
| 7402 | 750 | | 374 | 8583 | | | ľ |
| 1200 | 100 | 1 1000 | | 1 00000 | | : ʊʊʊ∪ | ı |

"DIXIE" HIGH PRESSURE RING PACKING

STYLE No. 45

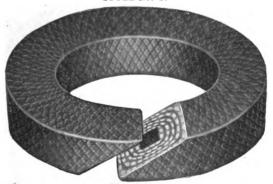


Fig. 6168A

This packing is adapted especially for superheated and pressure steam and high speed engines,

It is made of the best long fibre asbestos and lubricated with our own special compound. It also has a high grade rubber cushion core in the center.

It has been thoroughly tested in the most trying places with great success, and will not burn or blow out under the most severe conditions.

Other styles of core and construction furnished to order.

"HELICOID" RED CORE PISTON AND VALVE ROD PACKING



Fig. 6168B

Garco red core piston packing rings are especially adapted for medium steam pressures, high speed engines, etc.

This packing is made from a special loosely woven duck with a high grade red rubber core in the center, and is treated with our special process of lubrication. It will not harden, and is long lived, economical and durable.

Made in ring form to fit rod and box.

Exact measurements are necessary in ordering.

| Price | | | | pe | r pound | 1.50 |
|-------|------|------|------|--------|---------|------|
| | | | | | | |

PACKINGS IMPROVED RING PACKING STYLE NO. 5

Fig. 6770A

For all general purposes, except where steam of high pressure is used. Made from a fine quality of rubber and cotton duck manufactured especially for this purpose.

The lubricants are the best and are absorbed into the packing by a special process which insures the best results, and we believe this ring packing to be a superior article to any other of its kind on the market.

It is intended for piston and valve rods on all kinds of engines: Stationary, blower, hoisting, traction, marine—and also pumps of all kinds.

| Diameter of Ringsinches | ½ tò 24 |
|----------------------------------|-----------------|
| Thickness inches Price per pound | 14, 38, 12, 5/8 |
| Priceper pound | 1.20 |

IMPROVED SECTIONAL RING PACKING STYLE No. 10



Fig. 6770B

This style is made of the same fine quality as the No. 5 shown above. It is cut sectional and is intended for rods out of center; also cut rods and difficult places to keep tight.

Sectional rings can be furnished only when the rim or packing space is sufficient in width to cut in this manner.

When sectional can not be furnished, we will send the Improved Ring, Style No. 5, as in such places it can be used to better advantage.

| Diameter of Rings | inches | ½ to 24 |
|-------------------|-----------|------------------|
| Thickness | inches | 14, 3 8, 12, 5 8 |
| Price | per pound | 1.20 |
| | | |

PACKINGS IMPROVED WATERPROOF HYDRAULIC RING PACKING



Fig. 5636A

For general hydraulic work, cold water pistons, plungers and rods, elevators, accum-

wildows, hydraulic presses, centrifugal pumps, stern glands, cold oil and brine pumps.

Made of the finest quality of long fibre flax and treated with a special waterproof compound. This packing is self lubricating and therefore works with very little friction.

Exact measurements are required in ordering.

.....per pound |

HELICOID" IMPROVED SPIRAL PACKING STYLE No. 205



Fig. 5636B

This style packing is well and favorably known. It is made of the same high grade stock as the Improved Ring. It is intended for all general steam purposes, except where high pressure is used.

Made in all sizes from $\frac{3}{6}$ to $\frac{1}{2}$ inches. Each strip is 12 feet long, coiled as shown, and placed in a box adapted for each size, making it convenient to handle and safe from dust and grit.

1.20

| APPROXIMATE WEIGHT OF EACH BOX CONTAINING 12 FEET | | | | | | | | | | |
|---|--------------|--------------|-----------------|---------------|---------------|------------|---------------|--|--|--|
| Sizeinches | 3 | 1/4 | 1 ⁵ | 3/8 | 7 | 1/2 | 18 | | | |
| Weight | 7 oz. | 11 oz. | 15 oz. | 1 lb. 4 oz. | 1 lb. 12 oz. | 2 lbs. | 2 lbs. 12 oz. | | | |
| Sizeinches | 5 % | †A | 34 | 13 | 75 | 18 | 1 | | | |
| Weight | 3 lbs. 6 oz. | 4 lbs. | 5 lbs. | 6 lbs. | 6 lbs. 14 oz. | 71bs.8 oz. | 8 lbs. | | | |
| Sizeinches | 116 | 11/8 | $1\frac{3}{16}$ | 114 | 13 8 | 11/2 | | | | |
| Weight | 9 lbs. | 9 lbs. 8 oz. | 11 lbs. 10 oz. | 12 lbs. 8 oz. | 14 lbs. | 16 lbs. | | | | |



PACKINGS "DIXIE" HIGH PRESSURE SPIRAL PACKING STYLE No. 210



Fig. 5835A

This packing is made of the same high grade stock as Style No. 45 ring packing, the best long fibre asbestos, lubricated with a special compound, and with a high grade rubber cushion core in the center. Especially adapted for superheated and high pressure steam, and high speed engines.

| Sizeinches ½ | ' to 9 |
|--------------------|--------|
| 5126 | , 10 2 |
| D.: | 00 |
| Priceper pound 2 | |
| | |

APPROXIMATE WEIGHT OF EACH BOX CONTAINING 12 FEET

| Sizeinches Weight | 14 oz. | $\frac{\frac{5}{16}}{1 \text{ lb. } 3 \text{ oz.}}$ | 3 x 1 lb. 7 oz. | 7 116. 14 oz. | $\frac{\frac{1/2}{2}}{2 \text{ lb. } 8 \text{ oz.}}$ | 3 lb. 8 oz. | 5, <u>8</u> 4 lb, |
|----------------------|-------------|---|--------------------|------------------|--|-------------|----------------------|
| Sizeinches | 11/16 | 3/4 | 13 | 7/8 | 18 | 1 | 116 |
| Weight | 4 lb. 8 oz. | 5 lb. | 6lb, 10 oz. | 7 lb. 7 oz. | 8 lb. 6 oz. | 10 lb. | 11 lb. 8 oz. |
| Sizeinches | 11/8 | 1 3 | 114 | 13 % | 11/2 | | |
| Weight | 13 lb. | 13 lb. 12 oz. | 14lb.8oz. | 16 lb. | 18 lb. 8 oz. | | |

"HELICOID" RED CORE PISTON AND VALVE ROD SPIRAL PACKING STYLE NO. 215



Fig. 5835B

This packing is made of red ribbon core and layers of soft, loosely woven duck, thoroughly lubricated by a special process of lubrication.

Designed to meet the requirements of medium and low pressures, and will not harden or blow out. Put up in dust proof boxes 12 feet to each box.

| Cina inches 1/4a O |
|--------------------|
| Sizeinches 14 to 2 |
| |
| Price pound 1.00 |
| Thospound 1.00 |

PACKINGS "CAROLINA" HOT WATER SPIRAL PACKING STYLE NO. 225



Fig. 7452A

This packing is designed for hot water return and boiler feed pumps. It is intended for use with hot water at temperatures about 180 degrees Fahrenheit. This packing gives good results on rods in pumps handling returns from radiators, dry kilns, etc., also feeding hot water to boilers.

| | | |
|-------|---------------|--------|
| Size | inches | ⅓ to 2 |
| Price | per pound | 1.50 |

"IDEAL" PISTON PACKING STYLE No. 420



Fig. 7452B

This packing is manufactured to meet the demand for a compensating packing for all steam pressures used in engineering practice, and also for water, oil, ammonia and other general uses. We believe we have achieved a greater degree of success in this design than any other packing on the market made to meet similar requirements. The "Ideal" packing consists of two wedges backed by a soft oil cushion, as may be seen in illustration. Its principal features are the construction of the wedge sections and the oil cushion. These wedges are made of high grade fine woven cotton duck and rubber and have interposed between their adjacent surfaces, a thin strip of soft anti-friction metal, which renders the adjustment of the wedges sensitive, positive and easy, with the least possible pressure on the gland. The backing or oil cushion is made of an assestos core over which is braided wire covered strands, which add considerable strength and prevent the fibres being separated when subjected to pressure. The core acts as a reservoir for the lubricant, which is a high test cylinder oil. The several parts of the packing are coated with best foliated graphite before being put together, and the whole combination is compact and strong, yet flexible, and readily conform to the box and rod. The best materials are used in the construction, and great care is taken in the manufacture.

Furnished in sizes $\frac{1}{4}$ to 2 inches by sixteenths.

| | | | _ | | |
|-------|------|------|---|---------------|------|
| Price | | | | per pound | 2.00 |

"SEMIBRONZE" PACKING STVIE No 405



Fig. 5110A

HIGH PRESSURE

This packing is manufactured of the very best grade asbestos, under a patented cess. The core, which is the foundation of the packing, is a reservoir for the lubricant, and is composed of spun asbestos thoroughly saturated in valve oil, pressed into

shape and coated with graphite.

The covering or jacket of the packing is made of strands of asbestos. Each strand is braided over with a fine bronze wire, after which they are braided around the core of the packing, forming the jacket. All of the strands readily soak up oil and hold it, and the braiding of the wire being open permits the oil to flow readily from the fibre and carry with it the graphite to the rod.

Under this process of manufacture, the fibre or body of the packing is entirely encased in a network of wire. The wire itself adds to the lasting qualities of the packing, both by its own resistance to wear and by reason of its protection of the fibre

from being blown out of the stuffing box.

Semibronze packing has thoroughly incorporated with it two of the best lubricants known, pure foliated graphite and high grade cylinder oil.

Furnished in sizes 3/8 to 2 inches by sixteenths in 12-foot lengths in boxes, or longer lengths on reels.

Price.....per pound 2.00

REGULAR

STYLE No. 410

This packing is made under the same process as the High Pressure with the exception that the outer covering is made up of alternate strands of flax and asbestos, on an asbestos core.

This packing is for medium pressures and is not recommended for service over 100 pounds steam pressure.

Price......per pound | 1.50

HYDRAULIC

STYLE No. 415

This packing is made up on a flax core and covered with wire braided flax strands under the same process as described above.

The flax and lubricants are the best and being reinforced with fine bronze wire, the combination makes an excellent hydraulic packing.

| | - | | | | | | | |
|-------|--------------|---------------|-------------|--------|---------|---|-----|----|
| Price | | . | • • • • • • | pe | r pound | l | 1.3 | 50 |



DIAGONAL EXPANSION HIGH PRESSURE PACKING

STYLE No. 435

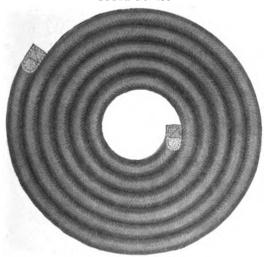


Fig. 5168A

This is a superior diagonal rod packing and is intended to meet the requirements of a high pressure packing for general use. Can be used for steam, water, ammonia, oil, gas, air, etc. For all pressures up to 250 pounds.

It is made of high grade materials and the most economical packing of its kind, being elastic, adjustable and durable. Put up in boxes of 5 to 10 pounds.

Special larger sizes made to order. Made in all sizes, 14 to 1½ inches.

| Style Number | 435 | 235 |
|----------------|------|--------|
| Description | Coil | Spiral |
| Priceper pound | 1.25 | 1.25 |

DIAGONAL EXPANSION MEDIUM PRESSURE PACKING

This is designed for all general uses and for pressures of about 100 pounds or less. It can be used for steam, water, ammonia, air, gas, etc., and has given good satisfaction for hydraulic work and mining pumps.

This packing is composed of two diagonal wedges in combination with a cushion of fine quality long fibre material. It is an automatic packing, as it compensates for the inequalities of rod and box. Flexible and elastic under all conditions, adjustable and durable.

Put up in boxes of 5 to 10 pounds. Made in all sizes, $\frac{1}{4}$ to $\frac{1}{2}$ inches.

| Style Number | 440 | 140 | 240 |
|--------------|------|------|--------|
| Description | Coil | Ring | Spiral |
| Price | 1.00 | 1.00 | 1.00 |



"PHOSPHATE BRAND" FLAX COIL PACKING 8TYLE No. 490

This style is a square braided hydraulic packing and is thoroughly lubricated with a special compound.

It is recommended for cold water plungers, centrifugal pumps, stern glands and general hydraulic service.

Put up in boxes or on reels.

Made in sizes ¼ to 2 inches square.

Price.....per pound | 1.25



Fig. 5085A

"GILT EDGE" GUM CORE COIL PACKING STYLE No. 460

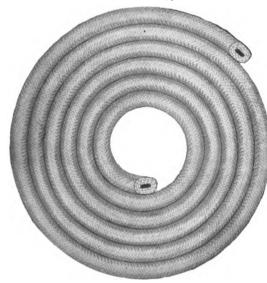


Fig. 50854

For general use this is our best grade. It is manufactured with a centre core of rubber which is rectangular in the oval and circular in the round. The covering is of flax saturated with the best lubricants and the combination makes a durable and elastic packing which is steam tight under a slight pressure of the gland.

The special lubricants make it an anti-friction packing and there is but little wear on the material or the rod.

Made in two grades to meet the demand for less expensive goods. Can be furnished in boxes or on reels. Made in sizes ½ to 2 inches by sixteenths. Special sizes made to order.

| Price | per pound | . 70 |
|-------|---------------|------|



"GILT EDGE" SQUARE FLAX PACKING

STYLE No. 470

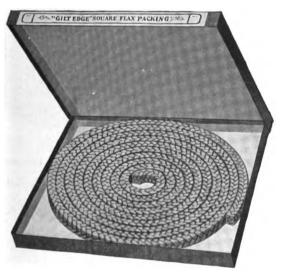


Fig. 5076A

Our Best Grade, which is braided square from the best quality strictly long fibre flax roving and is lubricated with our special compound which, combined with the solid square braid, makes a perfect flax packing for water. We guarantee this flax to be the best on the market. Put up in boxes as above, also on reels.

| Priceper p | pound | .80 |
|------------|-------|-----|

APPROXIMATE WEIGHTS AND AMOUNTS PER BOX

| Size Coll | | Colls Feet | WRI | GHT | Size | Coils | Feet | WEI | GHT | Size | Coils | Feet | WEI | GHT |
|-----------|------|------------|------|-----|--------|----------|------|------|-----|--------|-------|------|------|-----|
| Inches | Wils | reet | Lbs. | Oz. | Inches | Colls | reet | Lbs. | Oz. | Inches | Colls | rect | Lbs. | Oz. |
| 1/4 | 4 | 120 | 5 | 12 | 3/4 | 3 | 48 | 12 | | 11/4 | 2 | 22 | 16 | • |
| 3 4 | 4 | 84 | 6 | | 7/8 | 2 | 26 | 9 | 8 | 13/8 | 2 | 18 | 18 | |
| 1/2 | 4 | 88 | 12 | ١ | 1 | 2 | 24 | 10 | 14 | 11.2 | 2 | 18 | 21 | |
| 5 g | 3 | 57 | 10 | 10 | 11/8 | 2 | 24 | 14 | 2 | | • • • | | ١ | • • |

"CHICORA" SQUARE FLAX PACKING-STYLE No. 475

Our Special Grade, which is carefully constructed of long fibre and well lubricated; is well adapted for general service.

| Price per pound | . 70 |
|-----------------|------|
| | |

"NAVY" SQUARE FLAX PACKING-STYLE No. 480

Our Medium Grade is a good quality and will give excellent service.

| Price per pound .60 | Ü |
|-----------------------|---|

"COMMERCIAL" SQUARE FLAX PACKING-STYLE No. 485

Our "Commercial" Grade is well made and lubricated. This is a good, durable packing, and we can furnish it at a low price.

| Price | per pound | .50 |
|-------|-----------|-----|



"HECLA" AIR PUMP PACKING



Fig. 6205A

Moulded from special asbestos compound in convex and concave rings. Made in sets to fit rod and box exactly and is easily applied.

Sets are put up in boxes containing sufficient packing for both the air and steam ends of one pump.

| Price, | No. | 171, | for | 8 | -inch | Westingh | ouse I | ump, | (8 R | ings | er set |) | per set | .44 |
|--------|-----|------|-----|-----|-------|-----------|--------|---------|-------|-------|--------|----|---------|------|
| ** | " | 176, | 44 | 91 | ∕g- " | | | " | (8 | " - | " |) | . " | .44 |
| 44 | 66 | 181, | " | 11 | - " | " | | 44 | (8 | 44 | " | | . " | .88 |
| ". | 66 | 186, | 44 | No. | 1 and | 2 New Yor | k Air | Pump | (16 F | Rings | per se | t) | " | .88 |
| " | | 191, | 44 | • • | 5 New | York Air | Pump |) (16 Ř | lings | per s | et) | | . " | 2.10 |
| 44 | 46 | 196, | " | " | 6 " | ., ., | " - | (16 | " | - " |) | | . " | .88 |

"DIXIE" AIR PUMP PACKING



Pig. 6205B

Folded asbestos stock, material having the same basis as the "Semibronze" sheet packing.

Made in sets to fit rod and box exactly and is easily applied. Sets are put up in boxes containing sufficient packing for both the air and steam ends of one pump.

| Price, | No. | 172, | for | 8 | -inch | Westinghouse | Pump | (8 Rings | per set |) | per set | |
|--------|-----|------|-----|-----|-------|---------------|---------|-------------|---------|----------|---------|------|
| ** | 44 | 177. | " | 91 | ó- " | 7.6 | " | (8 " | - " | | . " | . 44 |
| " | 44 | 182, | 46 | 11 | - " | " | " | (8 " | 46 | | . " | .88 |
| 44 | " | 187, | " | No. | 1 and | No. 2 New Yor | k Air I | Pump (16 | rings j | per set) | " | .88 |
| " | " | 192, | 44 | ** | 5 New | York Air pum | p (16 R | ings per | set) | | 46 | 2.10 |
| 44 | 44 | 197, | " | 44 | 6 " | | (16 | |) | | " | .88 |

STYLE No. 575



Fig. 4995A



Fig. 4995B

Price, No. 575 Standard Round Tucks Packing, Made in Lengths of 12 feet, Sizes 1/4 to 1-inch Diameter with Rubber Core, Black

No. 580, Garco Special Fine Duck Packing, Made of the Finest Duck and Rubber, a Special Packing for Hot Water Service, also for High Pressure Hydraulic Work, Sizes 1/4-inch Square

1.00

1.00

STYLE No. 585



STYLE No. 595



Fig. 4995C



Fig. 4995D



Fig. 4995E

| Price, | No. 585, Standard Square Rubber Back Duck Packing for | 1 |
|--------|---|------|
| | Hydraulic Work, Made in 12-foot Lengths; Sizes 1/4-inch | 1 |
| | Square and Larger, Black Frictionper pound | 1.00 |
| 66 | No. 590, Standard Square Duck Packing, Used for Ordinary | |
| | Pump Work; Made in 12-Foot Lengths, Sizes 1/4-inch Square | |
| | and Larger, Black Friction " | 1.00 |
| 66 | No. 595, Regular Square Hydraulic Duck Packing for All | |
| | Hydraulic Work, Made in 12-foot Lengths, Sizes 1/-inch | |
| | Square and Larger, White Friction " | 1.00 |

STYLE No. 550



Fig. 4995F

"VALBESTINE" PACKING

This is our special valve stem packing manufactured from speciselected asbestos yarn, thoroughly lubricated. Made in round or square form, twisted or braided, with or without wire.

Will stand all pressures.

Put up in one or fivepound spools in the following sizes: $\frac{1}{16}$, $\frac{1}{8}$, $\frac{3}{86}$, $\frac{1}{4}$, $\frac{5}{16}$, $\frac{3}{8}$, $\frac{7}{16}$ and $\frac{1}{2}$.

Larger sizes to order.

..... per pound | 1.50

PACKINGS "AURORA" RED SHEET PACKING STYLE NO. 605



Fig. 9330A

"Aurora" packing is made of our high grade red compound of rubber, which is soft and tenacious and readily conforms to any inequalities of surface on flanged joints. It will remain soft and flexible, and will not crack and blow out. It makes a perfect steam joint and if properly removed, may be used again and again, packing it as well as when first inserted. It also makes a perfect packing for hydraulic and cold joints of all kinds. Its composition is such that it will withstand the action of steam, oils, alkalies, ammonia, etc.

The application of plumbago or chalk to the face of the packing before use prevents adhesion to the flanges, and makes it easier to break joints after use.

Furnished in sheets 36 inches wide, $\frac{1}{3}$, $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{14}$, and $\frac{3}{8}$ -inch thick.

Price.....per pound | 1.00

"MAGNOLIA" WHITE SHEET PACKING STYLE No. 615



Fig. 9330B

"Magnolia" sheet is composed of our special white compound of rubber, and posses ses great flexibility and toughness, and is recommended where condensation is found. Its composition is such that it will withstand the action of oils, liquors, alkalies, ammonia, etc.

It makes a perfect packing and, if properly removed, can be used again and again with success.

Furnished in sheets 36 inches wide, $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{16}$, $\frac{3}{16}$, $\frac{1}{4}$, and $\frac{3}{8}$ -inch thick.

| Style Number | 615 | *620 |
|----------------|-----|------|
| Priceper pound | | |

*Style No. 620 is made of the same compound as No. 615, but with wire insertion.

'SEMIBRONZE" SHEET PACKING STYLE No. 650



Fig. 9322A

In calling your attention to "Semibronze" sheet packing, we do so with full confidence of its merits and value to engineers.

We are aware of the fact that with the pressure of steam constantly increasing, a necessity has arisen for a new material for joints on engines, boilers, and pipes, to replace

rubber sheet packings, which have proved inefficient for high steam pressures.

"Semibronze" sheet packing will meet the conditions of the highest steam pressures, forming a perfect wire mesh in itself with asbestos spun around each individual semibronze wire, and waterproofed with a special compound.

This packing is of special value from the fact that it can be used wherever other packings are used and also in places where all other packings have failed to give service. It is particularly adapted to superheated steam and gas engine joints.

Carried in stock in thicknesses: \(\frac{1}{32}, \frac{1}{16}, \frac{32}{32}, \frac{1}{8}, \frac{3}{16}, \text{ and } \frac{1}{4}\)-inch and 39 inches wide.

Also furnished without wire, if so ordered.

Price......per pound 1.00

Graphited one or both sides to order.

CLOTH INSERTION SHEET PACKING For Low Pressure Steam and Water Joints



Fig. 9322B

Cloth insertion rubber sheet packing is particularly adapted to all water joints, but may also be used for low pressure steam joints. It is made of a rubber compound and cotton sheeting which produces a combination of the elasticity and flexibility of the rubber and the strength of the cloth. The cloth may be on one or both sides. When desired, this packing is made with wire insertion instead of the cotton sheeting.

This packing has all the essential qualities of a good sheet packing, being strong, durable, and of smooth finish.

Carried in stock in thicknesses: $\frac{1}{32}$ to $\frac{1}{4}$ -inch and 36 inches wide.

..... per pound Price....



PACKINGS PYROID" SHEET PACKING



This is a high grade compressed asbestos fibre sheet packing and is recommended for extreme high pressures and temperatures. Made in sheets 40x40 inches, $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$,

1/8, and 3-inch thick. Special size sheets to order. Price per pound 2.00



"IDEAL" RED TUBULAR GASKETS

These gaskets are made of our well-known red compound, a stock unexcelled as a universal packing. They are essentially adapted for general service and will not crack or blow out. They conform readily to unevenness of flanges and will not harden. With a box of each size on hand, the engineer can pack any joint perfectly without waste of material, as the shortest pieces can be quickly formed into a perfect gasket by the use of adhesive tapes and metal tubes sent with each box. Put up in neat boxes with full instructions for use.

Price per pound | 1.00

Fig. 9323B LENGTH AND APPROXIMATE WEIGHT PER BOX

| Diam. Inches | | Weight Pounds | | Diam. Inches | | Weight Pounds | |
|-------------------|----------------|--|---|-----------------|----------|------------------|--------------------------------------|
| 3 8 1/2 5 8 | 36 36 24 | $ \begin{array}{c c} 234 \\ 514 \\ 514 \end{array} $ | For Pipe Unions " Handholes " Manhole Plates | 3/4 7/8 | 18 12 | 6 6¼ | For Manhole Plates "Ex. Large Plates |

Larger sizes for special purposes to order. Also furnished with graphite finish, if desired.

"SEMIBRONZE" FLAT GASKETS

WIRE WOVEN

STYLE No. 815

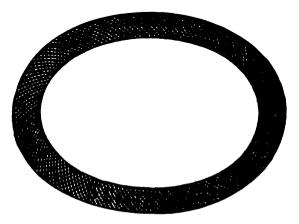


Fig. 3718A

"Garco Semibronze" Gaskets for manholes, handholes, and flanges on boilers are made from asbestos cloth, of which each strand is of pure asbestos yarn firmly twisted around fine bronze wire, and carefully constructed from this fabric, they will not blow out no matter how high the steam pressure on the boiler may be. We carry a stock of standard sizes, a list of which we give below.

In ordering give inside diameters, width of flange and thickness required Orders for special shapes should be accompanied with pattern.

| Price | per pound | 1.50 |
|-------|---------------|------|

STANDARD STOCK SIZES

| Inside Diameter Inches | Width of Flange Inches | Thickness Inches | Inside Diameter Inches | Width of Flange Inches | Thickness Inches |
|---------------------------|---------------------------|---------------------|---------------------------|---|----------------------|
| 3 x4 31/5x4 | 3/4 | 3 16 3 16 | 6x 8 7x 9 10x13 | 1 | 16 16 16 |
| 3 xō \$1∕4xō 4 xō | 3/4 | 18 18 | 10x13 10x14 10x15 | 114 114 114 | 74 17 14 17 |
| 434x5 4 x6 | 3 4 | 18 18 | 11x15 11x16 12x16 | 11/4 | 13 14 14 |

"SEMIBRONZE" TUBULAR GASKETS

(Patented)

STYLE No. 825

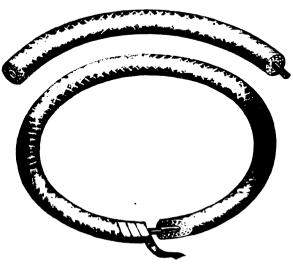


Fig. 4839A

High pressure metal insertion for handhole and manhole plates.

The purpose of this invention is to provide a gasket that will not be affected by any degree of heat, acids, gases, moisture, etc., and by its construction makes a tight joint in almost every place regardless of how rough or uneven the surface may be.

The construction of this gasket is a very decided improvement, because it may be used under all steam pressures and particularly with higher pressure, for which the old style rubber gasket is unfit,

It is made of a combination of the best grade of asbestos metallic sheet; a stock unexcelled as a universal packing and constructed with a metal center, making a construction of great strength and durability. It may also be shaped to any flange that is desired and will retain its form.

It has all the advantages of the old style gaskets, combined with greater wearing and heat resisting qualities. No other gasket covers such a wide range of usefulness.

It is packed in boxes and made in 12-foot lengths, sizes as follows: $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, and $\frac{7}{8}$ -inch.

Other sizes made to order.

| Price | . | . | er pound 2.00 |
|-------|-----------|----------------|-------------------|

ASBESTOS AND PISTON PACKINGS 18708 ROPE ASBESTOS WICK Sectional ASBESTOS AS RING PACKING Expansion ASBESTOS ROPE

Fig. 4355A

Fig. 4355B





Fig. 4355D

ASBESTOS ROPE AND WICK

Price, Asbestos Rope, Braided or Twist, Reels of 10, 15, 25 and 50 pounds, per lb. Wick, Standard Grade, 1/4, 1/2 and 1 lb. Balls, 5 and 10 lb. Spools

RING PACKINGS

Price, Sectional or Expansion. . . .

ROUND

Fig. 4355E







Price, Round Square, Rubber Back or Hydraulicper pound Empire Piston Packing..... Eureka "
Manhattan Piston Packing
Peerless " " 44

Black Hawk, Globe and Angle Valve Packing..... CANDLE







Fig. 4355K



Price, Soapstone Packing, Round Braided, all Sizes.....per pound Candle Wicking, Standard, in 5-lb, Sacks, about 12 Balls to lb...

Standard Square Flax Packing.....

OAKUM

HEMP AND JUTE PACKING





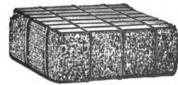
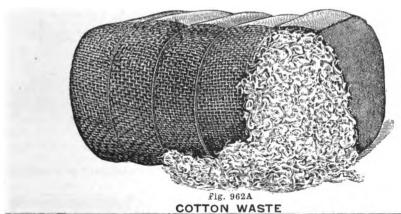


Fig. 4355N

Price, Italian, a Hemp Packing.....per pound Jute Packing for Calking..... Plumbers' Oakum, Spun...... Navy or U.S. Navy Oakum....

ASBESTOS CEMENT. ETC. MINERAL HAIR PRIT ASBESTOS BLOCK COVERING ASBESTOS CRMENT Fig. 4342D CHESTO CEMENT MAGNESIA BLOCK COVERING Fig. 4342A Fig. 4342B Fig. 4342C Fig. 4342E ASBESTOS CEMENT Price, Asbestos Cement, in 100-pound Bags..... 85° Magnesia, in 60-pound Bags.... MINERAL WOOL Sacks (extra) In bulk, prices on application. Weighs about 12 pounds per cubic foot. HAIR FELT-In Rolls of 300 Square Feet, Width 6 Feet Thickness.....inches 14 Price.....per square foot BLOCK COVERINGS—Standard Width 3 or 6 Inches and 30 Inches Long 1/2 34 7/8 114 11/4 13%11/2 15% 13/ 2 Thickness inches 1 27 27 30 $.4\overline{2}$.53 .60 Price....per square foot .30 .34 .38 .45 .49 .57 **2**13 234 Thickness.....inches 21/8 21/1 23 5 254 276 314 31 3 33/ .64 .68 .79 .90 .98 1.05 1.13 1.20 Price....per square foot .83 .87 HARD RED FIBRE SHEETS HARD FIBRE RED GREEN OR BLACK ROLLED TUBING ROUND RODS Fig. 4342F Fig. 4342G Fig. 4342H SHEETS Price, 1/64 and 1/32 inches thick, in Full Sheets...... 1/6, 3/2, 1/8, 3/6 and 1/4 inches thick, Sheet cut in Thirds...... " " Halves 3% and 1/2 TUBING AND RODSper pound ASBESTOS MILL BOARD-Sheets 40 x 40 Inches Thickness inches ASBESTOS Weight *pounds 12 14 Price per pound *Per sheet. ASBESTOS PAPER-In Flexible Rolls, 36 Inches Wide Price, $\frac{1}{32}$, $\frac{1}{16}$, $\frac{3}{32}$ and $\frac{1}{8}$ inches thick per pound Fig. 4342J

WASTE, ETC.



| | 001 | OIA AA | JIC | | | |
|---------------------------------|-----------------------|--------|-------|-------|--------|----------|
| Grade | Ex. Machine Copped | Extra | No. 1 | No. 2 | В | C |
| Price, Whiteper pound "Colored" | | | | | | |
| | WO | OL WA | STE | | | |
| Grade | | | | Best | Medium | Standard |
| | | | | | | |

| Grad3 | Best | Medium | Standard |
|-------------------------------|------|--------|----------|
| Price, Colored only per pound | | | |
| RAGS | 1 | | |

| SILK TOWELS | | | |
|--------------------|--------|---------|---------|
| Size | inches | 12 x 15 | 12 x 24 |
| Price, Unhemmedper | | | |
| " Hemmed | " | 1.10 | |

SILK CLOTH Price, Silk Cloth, 1 yard wide, any desired length.....per yard

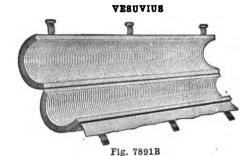
| CHAMOIS SKINS | First | Quality, | Yellow, | Double D | ressed, | Trimmed | |
|------------------------------|---------------|---------------|---------------|---|----------------|----------------|----------------|
| Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Sizeinches Priceper dozen | 6x8 .39 | 7x9 .60 | 9x11 1.00 | $\frac{11 \text{x} 13 \frac{1}{2}}{1.50}$ | 12x16 2.30 | 13x16 2.60 | 13x17 3.00 |
| Number | 8 | 10 | 12 | 14 | 15 | 16 | 17 |
| Sizeinches . Priceper dozen | 14x18 3.50 | 16x21 4.50 | 19x25 6.00 | 23x26 8.25 | 28x32 12.50 | 32x37 16.00 | 34x40 21.00 |
| | | SPON | SES | | | | |

| | SPONGES | | | | | | | |
|-------|---------|----------------|-----------------------|------|--------|-----------------|-------|------|
| Sizes | | | Large Medium Large | | Medium | Medium Small | Small | |
| | | | 1.50 | 1.50 | 1.50 | 1.25 | 1.00 | |
| 44 | " | " Sheep's Wool | 24 | 3.00 | 3.00 | 3.50 | 2.75 | 2.00 |
| 11 | Cuban | u* u | " | 2.75 | 3.00 | 3.00 | 2.50 | 2.00 |
| 44 | Nassau | uu | " | 2.75 | 3.00 | | 2.50 | 1.50 |
| u | a. | Velvet | ** | 2.00 | 2.00 | 2.25 | 1.75 | 1.75 |
| ш | Cuban | " | 44 | 2.25 | 2.25 | 2.25 | | |

SECTIONAL PIPE COVERING



Fig. 7891A



85 PER CENT CARBONATE OF MAGNESIA



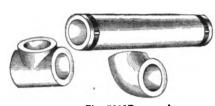


Fig. 7891D

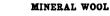




Fig. 7891E

HEAT PROOF



Fig. 7891P



Fig. 7891G



Fig. 7891H



TRIBESTOS

Fig. 7891J







VIBRO

DURO



Fig. 7891L



NEPTUNE



Fig. 7891M



Pig. 7891N

SECTIONAL PIPE COVERING

Hecla Covering is made of fibrous asbestos in size to fit $\frac{1}{2}$ to 16-inch pipe. Thickness, 1 to 3 inches; jacketed with canvas and held in place with metal bands.

Vesuvius Covering is constructed of successive layers of plain corrugated asbestos paper; it is made to fit ½ to 16-inch pipe and in thicknesses of ½ to 3 inches; jacketed with canvas and held in place with metal bands.

Asbestos Moulded Covering in sizes to fit ½ to 12-inch pipe; with canvas jacket and lap to be pasted over ends; held in place with metal bands.

Magnesia Covering is composed of 85 per cent pure carbonate of magnesium, combined with asbestos fibre, and formed into shape under hydraulic pressure; made to fit ½ to 14-inch pipe and in thicknesses of 1 to 3 inches. Jacketed with canvas, and held in place with metal bands.

Mineral Wool Covering, made of best grade of rock wool.

Heat proof: Made from the same material as asbestocel, but with corrugations running lengthwise; it is made to fit ½ to 16-inch pipe and in thicknesses of ½ to 2 inches. Neatly finished with canvas and bands.

Vibro: is a sectional Vitrified Air Cell Covering. Can be made and applied without any inflammable outer covering. Furnished to fit 1/2 to 12-inch pipe, canvased and with bands.

Palmetto: Composed of 3%-inch asbestos felt and 5%-inch corrugated wool felt: Adapted for surfaces subject to vibration. Furnished with canvas jacket and brass bands.

Tribestos: Made of ¼-inch asbestos felt on inside of section and the balance (¾-inch) of alternate layers of asbestos and wool felt; finished with canvas jacket with lap and metal bands.

Caraflora Wool Felt Covering is made of corrugated wool felt, with an interlining of three layers of asbestos felt, stitched together with steel wire; furnished without canvas jacket, unless so ordered.

Duro Wool Felt Covering, for low pressure work, made of corrugated wool felt, 3/s inch thick with one layer of asbestos; strong sheeting jacket with lap to be pasted over ends; held in place with metal bands.

Neptune Wool Felt Covering, for hot water pipes, made of corrugated wool felt %-inch thick with one layer of asbestos paper.

Jack Frost: To prevent freezing of cold water pipes. Composed of corrugated wool felt %-inch thick with interlining of 34-inch hair felt. Furnished with canvas and metal bands.

| Inside Diameter of Pipe, inches | 1/2 | 3, | 1 . | 114 | 1½ | 2 | 21/2 | 3 | 31/2 |
|---------------------------------|------|------|------|------|------|------|------|------|------|
| Price, Coveringper foot | .22 | .24 | .27 | | .33 | .36 | .40 | .45 | .50 |
| " Elbow Coverseach | .30 | .30 | .30 | .30 | .30 | .36 | .42 | .48 | .54 |
| " Tee " " | .36 | .36 | .36 | .36 | .36 | .42 | .48 | .54 | .60 |
| " Cross " " | .48 | .48 | .48 | .48 | .48 | .54 | .60 | .70 | .80 |
| " Globe Valve Covers " | .54 | .54 | .54 | .54 | .54 | .60 | .78 | .96 | 1.20 |
| " Flange Covers " | 50 | 50 | .50 | 50 | 50 | . 60 | .70 | 80 | 90 |
| Inside Diameter of Pipe, inches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Price, Coveringper foot | .60 | .65 | .70 | .80 | 1.00 | 1.10 | 1.20 | 1.30 | 1.85 |
| " Elbow Covers each | .60 | .72 | .90 | 1.30 | 1.80 | 2.40 | 3.00 | 3.60 | l |
| " Tee " " | .75 | .90 | 1.20 | 1.60 | 2.20 | 3.00 | 3.80 | 4.60 | 1 |
| " Cross " " | .95 | 1.10 | 1.50 | 2.00 | 2.80 | 3.60 | 4.40 | 5.20 | |
| " Globe Valve Covers " | 1.50 | 1.85 | 2.25 | 2.80 | 3.60 | 4.40 | 5.30 | 6.20 | |
| | 1.00 | 1.30 | 1.60 | 1.90 | 2.20 | 2.50 | 2.90 | 3.30 | 1 |



GRAPHITE PIPE JOINT COMPOUND, ETC.

PLAKE GRAPHITE

GRAPHITE COMPOUND

SMOOTH-ON







Fig. 7293A

Fig. 7293B

Fig. 7293C

PURE FLAKE LUBRICATING GRAPHITE

| | Paner (| 'ans, 36 | Tin | CANS | | | | | |
|--------------------------------|---------|----------|------------|------|--------------------|-----------|------------|---------|--|
| Packages | | Case | 10 in Case | | Paper Bags in Case | | Kegs | Barrels | |
| Weightpounds Priceper pound | | 1 .40 | 5 .34 | .32 | $\frac{25}{.30}$ | 50 .29 | 100 .28 | 400 | |

GRAPHITE PIPE JOINT COMPOUND

| Packages | Cans | | | Ke | egs | Barrels | |
|-------------------------------|------|----------|-----|------------|-----------|------------|------------|
| Weight pounds Price per pound | 1 | 5 .36 | .30 | .25 .28 | 50 .27 | 100 .26 | 700 .25 |

SMOOTH-ON COMPOUNDS

| Price, | Smoot | th-on Iron Cement, Nos. 1 and 2, Blue Label, For Engineers, per pound | .50 |
|--------|-------|---|-----|
| •• | 44 | " Elastic Cement. Gray Label. For Engineers" | .50 |
| " | 44 | " Castings, Grades A and B. Yellow Label. For Foundrymen " | .50 |
| ** | " | " Joints, Red Label. For Plumbers" | .50 |

GRAPHITE ROPE, CABLE AND CHAIN GREASE

| Packages | Cans | Fir | kins | K | Kegs | | |
|--------------------------------|------|------------|------------|-------------|--------------|--------------|--|
| Weightpounds Price per package | | 10 3.00 | 25 7.00 | 50 13.00 | 100 24.00 | 400 80.00 | |



Fig. 7293D

WHITE LEAD, GROUND IN OIL

| Price, Pure W | hite Lead | • • • • • • • • • • • • | • • • • • • • • • • • • • • • • • • • | per pound | • • • • • |
|---------------|--------------|-------------------------|---------------------------------------|------------|-----------|
| Put up in 12 | 2½, 25, 50 a | nd 100-pour | d kegs, 1, 2 | and 5-poun | d cans. |

RED LEAD

| Price, Dry Red Leadper pound | |
|------------------------------|--|
| " Ground in Oil" | |
| | |

Put up in $12\frac{1}{2}$, 25, 50 and 100-pound kegs, 1, 2 and 5-pound cans.

OILS, GREASES, ETC.



Fig. 7560A

| Price, Cylinder Oil | per gallon |
|-----------------------|------------|
| " Extra Cylinder Oil | , |
| " Red Engine Oil | |
| " Special Machine Oil | |
| " Castor Machine Oil | " |
| " Black Oil | " |
| " Cup Grease | |
| " Boiler Compounds | |

Prices on application.

ALBANY GREASE



Fig. 7560B

Albany Lubricating Compound is made in five different numbers

No. 0 is very soft, being used in extremely cold weather, and on exposed journals.

No. 1 is harder than No. 0, and is used on ordinary journals in cold weather, or in very cool or slow running journals, also elevator slides.

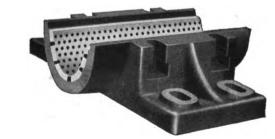
No. 2 is harder than No. 1, and is the grade ordinarily used in moderate and warm weather.

No. 3 is adapted to the use of all stationary, marine, and tug boat engines; also shafting in warm weather, dynamos, general electrical and high speed machinery.

No. XXX is a grade of extra hardness' which will lubricate journals with entire satisfaction, when no oil or other lubricant will work.

| Package | 1 lb. Cans | 5, 10 and 25 lb, Cans | 50-lb. Cans | 125 lb. Kegs | 200-lb. Half Bbls. | 400-lb. Bbls. |
|----------------|------------|--------------------------|-------------|-----------------|-----------------------|------------------|
| Priceper pound | .25 | .20 | .18 | .16 | .13 | .12 |

RANDALL GRAPHITE LUBRICATOR



Pig. 5971A

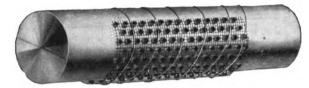


Fig. 5971B

Randall Graphite Sheet Lubricator is made of solidified graphite cones or tablets moulded on bronze wire cloth. When used in connection with babbitt metal it makes a bearing which has no equal for machinery, especially high speed, where bearings have a tendency to heat.

In many cases it displaces sufficient metal to pay for itself. Increases life of bearing several times.

No oil soaked belts. The saving of belting alone will pay the cost of the lubricator many times over. More belting is destroyed by oil than by actual wear.

Absolutely prevents hot boxes. No shut downs when Randall Graphite Sheet Lubricator is used, and no money wasted in paying employees for idle time.

Cleanliness Assured. This is an advantage that will be appreciated by those who have come in contact with machinery that must be lubricated by thorough saturation of oil.

DIRECTIONS FOR APPLYING

Cut piece from sheet about one-half inch shorter than length of box to be babbitted, wide enough to reach not quite half around the journal so that it will not reach quite to top of the box (see figure I); shape with the fingers to a half circle a little smaller than the journal to be babbitted. Place on journal and tie with fine copper wire; wind spirally. (See figure II).

Place in box and pour metal in usual way. The small ends of the tablets should always be placed in contact with the journal, so that the wire cloth will be embedded near the bottom of the box. Scrape the sides of the bearings after babbitting so that the journal will turn freely. It is not absolutely necessary to put in the caps unless the pull is against them.

All lubrication necessary when starting a bearing is to cover the face of the journal and the box with grease or good oil. The further use of oil is harmful and unnecessary waste.

Each sheet contains 144 square inches, enough to habbitt several boxes.

Guaranteed if not satisfactory we will refund for whole amount you have used and have on hand without question upon demand at any time.



WATERPROOF LEATHER BELTING SPECIAL PLANER NEPTUNE





Fig. 9508A

SPECIAL PLANER

ig. 9508B

This trade mark is stamped on every 10 feet of Special Planer Belting.

Special Planer is a special waterproof belt made from center stock, in single thickness up to 8 inches in width, and averages about 20 ounces to the square foot.

It is particularly adapted for heavy work with high speed and small pulleys, such as side heads on planers, etc.

We guarantee that the leather used in the const

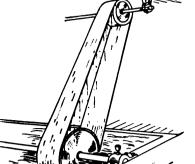
We guarantee that the leather used in the construction of Special Planer Belting is oak tanned under the long-time process, and is absolutely free from any ingredients for quickening the process or increasing the weight; if any defects either in material or workmanship appear in our belting when used under proper mechanical conditions, we agree, if notified promptly, to replace or repair such defective parts without cost.

NEPTUNE

Look for the above trade mark stamped on every 10 feet of Neptune belting.

Neptune is a special waterproof belt, single and double, made from center stock
and constructed with extreme care to withstand severe work and all effects of moisture
or water.

RUNNING IN WATER



GUARANTEE

We guarantee Neptune leather belting to be absolutely waterproof, that the laps will not loosen if wholly submerged in water, and should double belting be used, that it will not come apart in the laps or between the plies.

Neptune waterproof leather belting is the belting for damp or wet places.

Moisture doesn't injuriously affect it.

You can run it in water, if necessary; or out of doors; or over steaming vats—it will stand the test every time.

"Oh," you may say, "cotton belts or rubber belts are what I use in damp places."

Yes, but you are having some trouble with them all the time, aren't you?

Do your cotton or rubber belts last as long

as they should in every instance?
You know that there is something about

steam, especially, that quickly rots cotton and rubber.

Fig. 9508C Try this! Place a Neptune belt on some drive where you are now using a cotton or rubber belt and see if it doesn't last three times as long.

We have many letters from large lumber and saw mills, paper mills, cotton and woolen mills, dye houses, bleacheries and laundries, as well as cement plants, brick yards, packing houses, breweries and similar establishments where dampness gave them endless trouble when they used cotton and rubber belts,

These letters, which we shall gladly send on request, will convince you of the economy of Neptune belting.



SPECIAL LEATHER BELTING

'SPARTAN'



"GRA KNIGHT"



Fig. 9507B

SPARTAN

Look for this trade mark on every 10-ft. of genuine Spartan Belting.

"Spartan" is a special belt made from leather tanned particularly to withstand the effects of steam, water, oil, acid or gas fumes, and is especially adapted for hard service.

"Spartan" Belting is all that its name implies, and more. It is a unique belting made for a special purpose. There is no other belting like it, nor is there likely to be while there is any premium on expert knowledge, unlimited facilities and manufacturing experience.

GUARANTEE

"We guarantee that Spartan Belting will withstand exposure to either hot or cold air, water, steam, oil,gases and heat generated by excessive pulley friction."

"That owing to its unusual pliability it will grip the pulley better-run with less

tension and reduce the friction load."

"That under proper mechanical conditions it will transmit power with greater economy than any other material in use, thereby reducing the cost of power transmission."

"That it will, when used under the same conditions, outwear any other belting ma-

terial, saving loss of time and cost of replacement."

"We further guarantee that if any belt should prove defective by reason of fault in material or workmanship, we will furnish a new belt, or repair the defective part."

GRA KNIGHT

The above trade mark is stamped on every 10-ft. of genuine Gra Knight Belting.

"Gra Knight" (not waterproof) is made from first quality oak tanned center stock, medium weight, and being made in both singles and doubles, is a popular brand for all general use.

GUARANTEE

"We guarantee that the leather used in the construction of Gra Knight brand is oak tanned under the long-time process, and is absolutely free from any ingredients for quickening the process or increasing the weight. If any defects, either in material or workmanship, appear in our belting when used under proper mechanical conditons, we agree, if notified promptly to replace or repair such defective parts without cost to the purchaser.

LEATHER BELTING

STANDARD Adopted Nov. 21, 1906

| Width Inches | Price per Foot |
|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|-----------------|-------------------|
| 1/2 | .12 | 4 | .96 | 17 | 4.08 | 36 | 8.64 |
| 5/6 | .15 | 41/2 | 1.08 | 18 | 4.32 | 38 | 9.12 |
| 3/4 | .18 | 5 | 1.20 | 19 | 4.56 | 40 | 9.60 |
| 3/4 7/8 | .21 | 51/2 | 1.32 | 20 | 4.80 | 42 | 10.08 |
| 1 | .24 | 6 | 1.44 | 21 | 5.04 | 44 | 10.56 |
| 11/4 | .30 | 61/2 | 1.56 | 22 | 5.28 | 46 | 11.04 |
| 11/2 | .36 | 7 | 1.68 | 23 | 5.52 | - 48 | 11.52 |
| 13/4 | .42 | 8 | 1.92 | 24 | 5.76 | 50 | 12.00 |
| 2 | .48 | 9 | 2.16 | 25 | 6.00 | 52 | 12.48 |
| 21/4 | .54 | 10 | 2.40 | 26 | 6.24 | 54 | 12.96 |
| 21/2 | .60 | 11 | 2.64 | 27 | 6.48 | 56 | 13,44 |
| 23/4 | .66 | 12 | 2.88 | 28 | 6.72 | 60 | 14.40 |
| 3 | .72 | 13 | 3.12 | 29 | 6.96 | 64 | 15.36 |
| 31/4 | .78 | 14 | 3.36 | 30 | 7.20 | 68 | 16.32 |
| 31/2 | .84 | 15 | 3.60 | 32 | 7.68 | 72 | 17.28 |
| 33/4 | .90 | 16 | 3.84 | 34 | 8.16 | | |

Double Belts, Double above List.

ROUND

| Diameter inches | | | | | | | | 34 | 7/8 | 1 |
|------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Price, Twistedper foot | .08 | .12 | .17 | .22 | .27 | .38 | .48 | .60 | .80 | .96 |
| " Solid" | .07 | | .14 | .18 | .24 | | ١ | | | |

AMERICAN PATENT JOINT LINK



Fig. 2131A

PRICE PER FOOT

| Width of Belt | 7 | THICKNES: | s of Line | s, Inches | 3 | Width | THICKNE | 88 OF LINK | s, Inches |
|-----------------|------|-----------|-----------|-----------|------|-------------------|---------|------------|-----------|
| inches | 178 | 16 | H | 7.8 | 1 | of Belt Inches | 116 | 7 % | 1 1 |
| 1 | .20 | .20 | .25 | .30 | .35 | 10 | 2.50 | 3.00 | 3.50 |
| 11/2 | .30 | .30 | .38 | .45 | .52 | 11 | 2.75 | 3.30 | 3.85 |
| 2 | . 40 | .40 | .50 | .60 | .70 | 12 | 3.00 | 3.60 | 4.20 |
| $2L_2$ | .50 | .50 | .63 | .75 | .87 | 13 | 3.25 | 3.90 | 4.55 |
| 3 | .60 | .60 | .75 | .90 | 1.05 | 14 | 3.50 | 4 20 | 4.90 |
| 3⅓ | .70 | .70 | .88 | 1.05 | 1.22 | 15 | 3.75 | 4.50 | 5.25 |
| 4 | .80 | .80 | 1.00 | 1.20 | 1.40 | 16 | 4.00 | 4.80 | 5.60 |
| 412 | | .90 | 1.13 | 1.35 | 1.57 | 18 | 4.50 | 5.40 | 6.30 |
| 5 | | 1.00 | 1.25 | 1.50 | 1.75 | 20 | 5.00 | 6.00 | 7.00 |
| 51 ₂ | | 1.10 | 1.38 | 1.65 | 1.92 | 22 | 5.50 | 6.60 | 7.70 |
| 6 | | 1.20 | 1.50 | 1.80 | 2.10 | 24 | 6.00 | 7.20 | 8.40 |
| 7 | | 1.40 | 1.75 | 2.10 | 2.45 | 26 | 6.50 | 7.80 | 9.10 |
| 8 | | 1.60 | 2.00 | 2.40 | 2.80 | 30 | 7.50 | 9.00 | 10.50 |
| 9 | | | 2.25 | 2.70 | 3.15 | 36 | 9.00 | 10.80 | 12.60 |

RUBBER BELTING

BRANDS

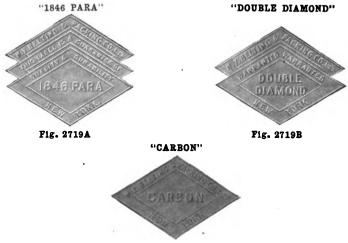


Fig. 2719C

Triple Diamond "1846 Para" Brand guarantees a superior article; the best we can buy; the best that money can buy.

"Double Diamond" denotes a fine, strictly high grade quality.
Single Diamond or "Carbon" means good goods made by exactly the same processes as the better grades, but of material less expensive.

"Test Special," a belt of sterling quality.

In comparison with other kinds, rubber belting possesses the highest efficiency for the transmission of power. Its basis of strength is cotton duck, the plies of which can be increased to resist any required tensile strain, and uniformity of strength and thickness throughout can always be relied upon.

ENDLESS BELTS

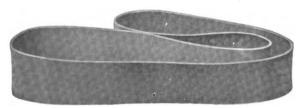


Fig. 2719D

Endless belts are made in any desired length, an extra three feet being charged for the splice. Only the best materials and workmanship are used in the manufacture of

these belts, and they are fully guaranteed to give satisfaction.

Special orders for belts of any thickness and width can be executed from three to six days after receipt of the order. In running belts, protect them from contact with grease or animal oil, as they will decompose the rubber and seriously injure the belt.

All of our belts are vulcanized in hydraulic pre ses, and are stretched with patent hydraulic stretchers, thus insuring uniformity of thickness, smoothness of surface, and are, of necessity, perfectly straight on account of this process.

RUBBER BELTING



Fig. 8191 A IN EFFECT MAY 2, 1910

| | | | PRICE | PER | Гоот | | | | | | PRIC | E PER | г Гоот | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|-------|-------|-------|-------|--------|-------|-------|
| Width | 2-Ply | 3-Ply | 4-Ply | 5-Ply | 6-Ply | 7-Ply | 8-Ply | Width Inches | 2-Ply | 3-Ply | 4-Ply | 5-Ply | 6-Ply | 7-Ply | 8-Ply |
| 1 | .09 | .11 | .13 | | | | | 18 | 1.55 | 1.87 | 2.22 | 2.77 | 3.33 | 3.88 | 4.44 |
| 11/4 | .11 | .13 | .16 | | | | | 20 | 1.74 | 2.09 | 2.49 | 3.10 | 3.73 | 4.35 | 4.97 |
| 11/2 | .13 | .15 | .19 | .23 | | | | 22 | 1.94 | 2.33 | 2.77 | 3.47 | 4.16 | 4.85 | 5.54 |
| 13/4 | .15 | .17 | .22 | .27 | | | | 24 | 2.16 | 2.60 | 3.08 | 3.85 | 4.62 | 5.39 | 6.16 |
| 2 | .18 | .20 | .25 | .31 | .37 | | | 26 | 2.38 | 2.86 | 3.39 | 4.23 | 5.08 | 5.93 | 6.78 |
| 21/2 | .22 | .25 | .31 | .38 | .46 | | | 28 | 2.60 | 3.12 | 3.70 | 4.62 | 5.54 | 6.47 | 7.39 |
| 3 | .26 | .30 | .37 | .45 | .55 | | | 30 | 2.82 | 3.39 | 4.00 | 5.00 | 6.00 | 7.00 | 8.00 |
| 31/2 | .30 | ,35 | .43 | .53 | .65 | | | 32 | 3.04 | 3.65 | 4.31 | 5.39 | 6.47 | 7.55 | 8.62 |
| 4 | .34 | .40 | .50 | .61 | .75 | .86 | | 34 | 3.26 | 3.92 | 4.62 | 5.78 | 6.93 | 8.09 | 9.24 |
| 41/2 | .38 | .45 | .55 | .69 | .84 | .96 | | 36 | 3.48 | 4.18 | 4.93 | 6.16 | 7.39 | 8.62 | 9.86 |
| 5 | .42 | .50 | .61 | .76 | .91 | 1.06 | | 38 | 3.70 | 4.44 | 5.24 | 6.55 | 7.85 | 9.16 | 10.47 |
| 6 | .50 | .60 | .72 | .89 | 1.08 | 1.25 | 1.44 | 40 | 3.92 | 4.71 | 5.55 | 6.93 | 8.32 | 9.70 | 11.00 |
| 7 | .59 | .70 | .84 | 1.04 | 1.25 | 1.46 | 1.68 | 42 | 4.14 | 4.97 | 5.85 | 7.32 | 8.78 | 10.24 | 11.70 |
| 8 | .67 | .80 | .96 | 1.19 | 1.44 | 1.68 | 1.92 | 44 | 4.36 | 5.24 | 6.16 | 7.70 | 9.24 | 10.78 | 12.32 |
| 9 | .76 | .90 | 1.07 | 1.34 | 1.60 | 1.88 | 2.16 | 46 | 4.58 | 5.50 | 6.47 | 8.08 | 9.70 | 11.32 | 12.94 |
| 10 | .84 | 1.00 | 1.20 | 1.49 | 1.77 | 2.09 | 2.40 | 48 | 4.80 | 5.76 | 6.73 | 8.47 | 10.16 | 11.86 | 13.55 |
| 11 | .92 | 1.10 | 1.32 | 1.63 | 1.96 | 2.29 | 2.62 | 50 | 5.02 | 6.03 | 7.08 | 8.85 | 10.63 | 12.40 | 14.17 |
| 12 | 1.00 | 1.20 | 1.43 | 1.78 | 2.15 | 2.50 | 2.85 | 52 | 5.22 | 6.29 | 7.39 | 9.24 | 11.09 | 12.94 | 14.78 |
| 13 | 1.10 | 1.30 | 1.56 | 1.95 | 2.34 | 2.73 | 3.12 | 54 | 5.46 | 6.56 | 7.70 | 9.63 | 11.55 | 13.48 | 15.40 |
| 14 | 1.19 | 1.40 | 1.69 | 2.11 | 2.54 | 2.96 | 3.39 | 56 | 5.68 | 6.82 | 8.01 | 10.01 | 12.01 | 14.01 | 16.02 |
| 15 | 1.28 | 1,52 | 1.83 | 2.28 | 2.74 | 3.19 | 3.65 | 58 | 5.90 | 7.08 | 8.32 | 10.40 | 12.47 | 14.55 | 16.63 |
| 16 | 1.37 | 1.65 | 1.96 | 2.44 | 2.94 | 3.42 | 3.92 | 60 | 6.12 | 7.35 | 8.62 | 10.78 | 12.94 | 15.09 | 17.25 |

Endless belts same list as above, except that three feet extra are charged for in splicing.

All other widths and plies at proportionate prices.

This belt is made for every kind of service and is manufactured with a complete and thorough knowledge of belt construction.

Specifications for belt to meet the most severe and unusual conditions solicited, special belts for Saw Mills, Paper Mills, Oil Wells, etc.

Seven-ply belts and heavier made to order for purposes where great strength is required. To obtain lists on heavier belts, use four-ply as a basis, adding 25 per cent for each additional ply.

STITCHED CANVAS AND SOLID COTTON WOVEN BELTING SOLID COTTON WOVEN







Fig. 968A

Fig. 968B

| STITO | CHED | CAN | VAS A | dopted | Oct. 1, | '10 | SOL | ID W | OVEN | COTT | TO N | |
|-----------------|---------------------|-------|---------|-----------|---------|-----------------|------------------|---------------------|----------|-----------|---------|----------|
| | | Pric | E PER I | тоот | | | | I | PRICE PI | ER FOOT | | |
| Width Inches | 4-Ply | 5 Ply | 6-Ply | 8-Ply | 10-Ply | Width Inches | 2-Ply | 3-Ply | 4-Ply | 5-Ply | 6-Ply | 8-Ply |
| | | | | | | | | | | | | |
| 1 | .10 | | | | | 34 | .03 | | | | • • • • | |
| 112 | .15 | | •••• | • • • • | | 1 | .04 | .05 | • • • • | • • • • | •••• | • • • • |
| 2 | .20 | .25 | .30 | • • • • | • • • • | 114 | $.04\frac{1}{2}$ | 051_{2} | • • • • | • • • • • | •••• | |
| 21.2 | .25 | .31 | .38 | • • • • • | | 11/2 | .05 | .06 | ;; | •••• | • • • • | • • • • |
| 3 | .30 | .38 | .45 | • • • • | | 2 | .06 | .08 | . 12 | •••• | | • • • • |
| 31_{2} | .35 | . 14 | .53 | | | $2\frac{1}{2}$ | 0612 | .10 | .14 | | •••• | |
| 4 | . 40 | .50 | .60 | .80 | | 3 | .07 | .12 | .16 | .25 | | |
| 41_{2} | .45 | .56 | .68 | .90 | | 3^{1}_{2} | .08 | .14 | .18 | .28 | | |
| 5 | .50 | .63 | .75 | 1.00 | | 4 | .09 | .15 | .21 | .30 | .38 | |
| 6 7 | .60 | . 75 | .90 | 1.20 | | 41 2 | .11 | .17 | .24 | .32 | .40 | |
| 7 | . 70 | .88 | 1.05 | 1.40 | | 5 | . 13 | . 19 | .26 | .34 | .42 | |
| 8 | .80 | 1.00 | 1.20 | 1.60 | | 51_{2} | .15 | .21 | .28 | .36 | .44 | |
| 9 | .90 | 1.13 | 1.35 | 1.80 | | 6 | .17 | .23 | .30 | .39 | .46 | .60 |
| 10 | 1.00 | 1.25 | 1.50 | 2.00 | | 7 | . 19 | .27 | .34 | .45 | .51 | .70 |
| 11 | 1.10 | 1.38 | 1.65 | 2.20 | | 8 | .21 | 31 | .38 | . 50 | .57 | .80 |
| 12 | 1.20 | 1.50 | 1.80 | 2.40 | 3.00 | 9 | .23 | .35 | . 44 | . 56 | .66 | .9: |
| 13 | 1.43 | 1.79 | 2.15 | 2.86 | 3.58 | 10 | .26 | .39 | .50 | .63 | .75 | 1.10 |
| 14 | 1.54 | 1.93 | 2.31 | 3.08 | 3.85 | 12 | .33 | .48 | .60 | . 75 | .90 | 1.30 |
| 15 | 1.65 | 2.06 | 2.48 | 3.30 | 4.13 | 14 | .41 | .60 | .75 | .94 | 1.12 | 1.60 |
| 16 | 1.76 | 2.20 | 2.64 | 3.52 | 4.40 | 16 | . 49 | .72 | .90 | 1.12 | 1.35 | 1.9 |
| 18 | 1.98 | 2 48 | 2.97 | 3.96 | 4,95 | 18 | .57 | .82 | 1.00 | 1.28 | 1.50 | 2.1 |
| 20 | 2.20 | 2.75 | 3.30 | 4.40 | 5.50 | 20 | .61 | .90 | 1.15 | 1.44 | 1.72 | 2.3 |
| 22 | 2.42 | 3.03 | 3.63 | 4.84 | 6.05 | 22 | .65 | 1.00 | 1.35 | 1.62 | 1.94 | 2.60 |
| $\frac{24}{24}$ | 2.64 | 3.30 | 3.96 | 5.28 | 6.60 | 24 | .69 | 1.10 | 1.55 | 1.80 | 2.15 | 2.8 |
| 26 | 3.12 | 3.90 | 4.68 | 6.24 | 7.80 | 26 | .77 | 1.35 | 1.75 | 2.00 | 2.36 | 3.10 |
| 28 | 3.36 | 4.20 | 5.04 | 6.72 | 8.40 | 28 | | 1.50 | 1.90 | 2.15 | 2.60 | 3.3 |
| 3 0 | 3.60 | 4.50 | 5.40 | 7.20 | 9.00 | 30 | .90 | 1.60 | 2.10 | 2.35 | 2.85 | 3.6 |
| $\frac{32}{32}$ | 3.84 | 4.80 | 5.76 | 7.68 | 9.60 | 32 | 1.00 | 1.70 | 2.25 | 2.60 | 3.00 | 3.8 |
| 34 | 4.08 | 5.10 | 6.12 | 8.16 | 10.20 | 34 | 1.10 | 1.80 | 2.40 | 2.80 | 3.25 | 4.1 |
| 36 | 4.32 | 5.40 | 6.48 | | 10.80 | 36 | 1.20 | 1.90 | 2.50 | 3.00 | 3.50 | 4.3 |
| 38 | 4.94 | 6.18 | 7.41 | | | 38 | 1.30 | 2.05 | 2.65 | 3.20 | 3.70 | 4.6 |
| 40 | 5.20 | 6.50 | 7.80 | 10.40 | 13.00 | 40 | 1.40 | 2.15 | 2.80 | 3.40 | 3.90 | 4.8 |
| 42 | 5.46 | 6.83 | 8.19 | 10.92 | 13.65 | 42 | 1.50 | $\frac{2.16}{2.25}$ | 2.90 | 3.60 | 4.05 | 5.10 |
| 44 | 5.72 | 7.15 | 8.58 | 11.44 | | 14 | 1.60 | 2.35 | 3.00 | 3.75 | 4.20 | 5.4 |
| 46 | 5.98 | 7.48 | 8.97 | 11.96 | 14.95 | 48 | 1.80 | $\frac{2.45}{2.45}$ | 3.20 | 4.00 | | |
| | $\frac{5.96}{6.24}$ | 7.80 | 9.36 | 12.48 | 15.60 | 10 |) | 1 | 1 | 1 | 4.80 | 5.8 |
| 48 | 0.24 | 1.00 | 0.00 | 114.30 | 10,00 | | • • • • • | | <u> </u> | <u> </u> | 1 | <u> </u> |

LACE LEATHER BELT LACINGS, ETC.







Fig. 8618A

LACE LEATHER

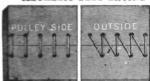
Fig. 8618B

| | | | |
|-------|----------|-----------|---|
| Price | Coupe's | . | per square foot |
| 64 | Magnolia | | |
| | | | • |

CUT LACING-Tanned or Rawhide

| Widthinches | $14 	 5_{16}$ | 3.8 | 76 | 1/2 | 96 | $\frac{5}{8}$ | 34 | 7 ± 1 | 1 |
|----------------------------------|---------------|------|------|------|------|---------------|------|-----------|------|
| Widthinches Priceper 100 feet | 1.25 1.50 | 1.75 | 2.00 | 2.25 | 2.50 | 3.00 | 3.75 | 4.50 | 5.00 |

METALLIC BELT LACING



Pig. 8618C

COPPER RIVETS AND BURRS







Fig. 8618D

METALLIC BELT LACING

| Number | 0 | 1 | 2 | 2 | 3 |
|---|----------------|--------------------------|---------------------------|-------------------------------|------------------------------|
| For Belts Width of Belt. inches Priceper 100 feet | 21/2 and under | Single 3 to 5 2.00 | Single 6 to 12 2.00 | Double 6 and under 2.00 | Double 6 and over 2.00 |

COPPER RIVETS AND BURRS

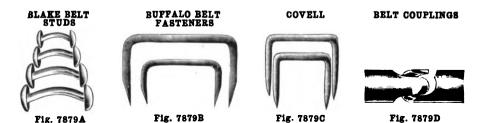
| Number | | | | | | | | | |
|-------------------------------------|-----|-----|-----|------|-----|-----|-----|-----|------|
| Price, in 1 or 4 lb. boxesper pound | .49 | .50 | .52 | 0.54 | .56 | .58 | .60 | .65 | . 70 |
| | .52 | .53 | .55 | 0.57 | .59 | .61 | .63 | .68 | . 73 |

BELT HOOKS



| Number 15 | 14 1 | 3 12 | 11 10 | 9 8 | 7 | 6 | 5 |
|--------------------|----------|-----------------------|----------|-------------|---------|-------|-------|
| Priceper 1000 2.00 | 2.40 2.0 | $60 \ \ 2.80 \ \ \ 3$ | 00 3.50 | 4.00 5.00 | 6.00 | 8.50 | 11.00 |
| Number | 4 | 3 2 | 1 Si | ze | inches | 214 | 3 |
| Price per 1000 | 14.00 1 | 16.00 20.00 | 30.00 Pr | icep | er 1000 | 50.00 | 60.00 |

BELT FASTENERS



BLAKE'S BELT STUDS

| Number | 6 | 5 | 4 | 3 | 2 | 1 | 0 | 00 |
|--------------|-----|-----|-----|-----|------|------|------|------|
| Priceper 100 | .60 | .70 | .80 | .90 | 1.25 | 1.65 | 2.00 | 2.50 |

No. 00 for heaviest double leather or 5 and 6-ply rubber belt. No. 6 for thinnest sewing machine belt; intermediate size in proportion.

BUFFALO BELT FASTENERS

| Number | 15 | 13 | 10 | 8 | 7 | 6 |
|-----------------------|------|------|------|------|------|------|
| Number in boxper 1000 | 1000 | 1000 | 1000 | 500 | 250 | 250 |
| | 1.50 | 2.00 | 2.50 | 3.50 | 4.00 | 5.00 |

No. 15 for light, single, and very small belts.

No. 13 for ordinary single belts and general use, and 3 and 4-ply rubber and cotton belts.

No. 10 for extra heavy and wide single belts, and small and light double belts, and 3 and 4-ply rubber and cotton belts.

No. 8 for ordinary double belts, and wide 4-ply rubber and cotton belts. Nos. 6 and 7 for extra heavy and wide double leather and rubber belts.

COVELL BELT FASTENERS

| Number | 0 | 1 | 11/2 | 2 | 3 | 4 |
|--------|------|------|------|------|------|------|
| Price | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 | 1.50 |

BELT COUPLINGS

| Size, Outside Diamin. Belt Couplingper doz. | 1/8 | 532 | 3/16 | 7/82 | 14 | %32 | 5/16 | 11/32 | 3/8 | 1 /16 |
|---|------|------|------|-------|------|-------|-------|-------|-------|--------------|
| | | | | | | | | | | |
| Size. Outside Diamin. | 1/2 | %16 | 5/8 | 11/16 | 3/4 | 7/8 | 1 | 11/8 | 114 | |
| Belt Couplingper doz. | 4.00 | 5.00 | 6.00 | 7.50 | 9.00 | 13.00 | 18.00 | 22.00 | 26.00 | |



BELT HOOKS AND LACINGS

BRISTOL

SIZES Nos. 00-5

SIZES Nos. 1100-119





Fig. 7516A

Fig. 7516B

| Thickness | FOR | LEATHER | For | WOVEN | For A | LL KINDS | FOR ALL KINDS | | |
|------------------------|-------------|-------------------------|-------------|-------------------------|---|---|-----------------------|---|--|
| of Belt Inches | Size No. | Price per 100 Inches | Size No. | Price per 100 Inches | Size No. | Price per 100 Inches | Size No. | Price per 50 Pieces | |
| 14 to 1/8 | 00 | 1.00 1.00 | 100 10 | 1.00 1.00 | $\frac{1100}{110}$ | .90 1.00 | 3100 310 | .40 .50 | |
| # 17 # 14 | ï | 1.50 | ii | 1.50 | $\frac{1101}{111}$ | 1.50 | $\frac{310^{1}}{311}$ | .60 .70 | |
| 14 " 14 14 " 18 | 3 | 2.00 2.50 | 12 13 | $\frac{2.00}{2.50}$ | $\begin{array}{c} 112 \\ 113 \end{array}$ | $\frac{2.00}{2.50}$ | 312 313 | $\frac{1.10}{1.79}$ | |
| 1/8 " 1/8 1/8 " 1/8 | 5 | 3.00 3.50 | 14 15 | $\frac{3.00}{3.50}$ | 114 115 | $\frac{3.00}{3.50}$ | 314 315 | $\frac{2.30}{3.50}$ | |
| 71 | :: | ! | 17 19 | $\frac{4.95}{6.05}$ | $\begin{array}{c} 117 \\ 119 \end{array}$ | $\begin{array}{c} 4.95 \\ 6.05 \end{array}$ | 317 319 | $\begin{array}{c} 5.50 \\ 9.00 \end{array}$ | |

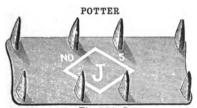


Fig. 7516C

NOVELTY OR POTTER

| For Belts | 3-Ply Rubber or Canvas | | | | 4-Ply Rubber or Canvas | | | | Old 4-Ply Rubber or Canvas | | |
|---|---------------------------|-----------------|---|-----------------|---------------------------|--|-----------------|--|--|------------------|-------------------------|
| Number | 1 2 12 | 17 2½ .00 | $\begin{bmatrix} 20\\3\\7.00 \end{bmatrix}$ | 21 4 3.00 | 13 2 5.00 | $\begin{vmatrix} 14 \\ 2\frac{1}{2} \\ 6.50 \end{vmatrix}$ | 15 3 7.50 | $ \begin{array}{c c} 16 \\ 4 \\ 9.50 \end{array} $ | $\begin{array}{c} 27 \\ 2 \\ 8.00 \end{array}$ | 18 3 10.00 | 19 4 12.00 |
| For Belts | Ru | 5 as | nd 6-Pl r or Ca | y n vas | | 7 and Rubber s | | | Extra l Rubbe | Heavy Lerand Ca | eathe r invas |
| Number For Belts inches Price per hundred | | d 5 | 22 3 10.00 | | 23 4 .00 | 24 3 12.00 | 25 4 15. | | 33.00 | Spec'l "A" 33.00 | Spec'l "B" 33.00 |

Special "B" has teeth 34-inch, long, Special "A" 36-inch, and Special "AA"1-inch long.

| For Belts | Single Leather | | | | | | | | Double Leather | | | |
|---|----------------|---|--|---|----------------|--------------------|--|--|---|---|--|---|
| Number For Beltsinches Priceper hundred | 1 1 1.50 | $egin{array}{c} 2 \\ 1\frac{1}{2} \\ 2.00 \\ \end{array}$ | $\begin{vmatrix} 3\\2\\2.50 \end{vmatrix}$ | $\begin{vmatrix} 4 \\ 2\frac{1}{2} \\ 3.00 \end{vmatrix}$ | 5 3 3.50 | $\frac{6}{3^{1}3}$ | $\begin{bmatrix} 7\\4\\5.50 \end{bmatrix}$ | $\begin{bmatrix} 8 \\ 2 \\ 5.00 \end{bmatrix}$ | $\begin{vmatrix} 9 \\ 2\frac{1}{2} \\ 6.50 \end{vmatrix}$ | $\begin{vmatrix} 10 \\ 3 \\ 7.50 \end{vmatrix}$ | $egin{array}{c} 11 \ 3_{1/2} \ 8.50 \ \end{array}$ | $egin{array}{c} 12 \\ 4 \\ 9.50 \\ \end{array}$ |

BELT TOOLS BELT PUNCHES

ROUND PUNCH

SOCKET PUNCH





Fig. 7716A ROUND AND OVAL PUNCHES

Number 1, 2, 3, 4, 5, 6 10, 11, 12 13, 14, 15, 16 00 7, 8, 9 0 2.20 2.00 2.50 3.00 5.00 Price, Round, per dozen 2.403.00 3.40 3.20 3.50 4.00 " Oval. " 6.00

| SOCKET PUNCHES | | | | | | | | | | |
|----------------|-------|-------|-------|-------|-------|--------------------|----------|-------|-------|-------|
| Sizeinches | 7/16 | 1/2 | %6 | 5/8 | 11/16 | 3/4 | 13/6 | 7/8 | 11/16 | 1 |
| Priceper dozen | 9.50 | 10.00 | 10.50 | 11.00 | 11.50 | $\overline{12.00}$ | 12.50 | 13.00 | 13.50 | 14.00 |
| Sizeinches | 11/6 | 11/8 | 13/6 | 11/4 | 15/6 | 13/8 | 17/6 | 11/2 | 15/8 | 13/4 |
| Priceper dozen | 16.00 | 18.00 | 20.00 | 22.00 | 24.00 | 26.00 | 29.00 | 32.00 | | |
| <u>" each</u> | | | | | | | <u> </u> | | 2.95 | 3.20 |
| Sizeinches | 17/8 | 2 | 21/8 | 21/4 | 28/8 | 21/2 | 25/8 | 234 | 27/8 | 3 |
| Price each | 3.50 | 3.90 | 4.30 | 4.80 | 5.40 | 6.10 | 6.80 | 7.50 | 8.25 | 9.00 |

0

BELT PUNCH



 Fig. 7716C
 BELT PUNCHES
 Fig. 7716D

 Price, 8-inch Punches
 per dozen
 12.65

 " Extra Tubes, %-inch to No. 2.
 "
 3.50

 Price, 10-inch Punches
 per dozen
 13.70

 " Extra Tubes, ¼ and %-inch an

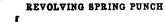








Fig. 7716E REVOLVING SPRING PUNCHES Fig. 77161

| Number of Tubes | 4 | 6 |
|-----------------------------------|-------|-------|
| Price, Revolving Punchesper dozen | 18.00 | 21.00 |
| " Extra Tubes " | 2. | 00 |

| COMBINATION COTTERS AND PLIERS | |
|--------------------------------|------|
| Sizeinches | 51/2 |
| Price each | . 75 |

1001

TOOLS BELT

LOTHROP'S BELT AWL

AWL AND PLIERS COMBINED FOR USE WITH BELT STUDS





Fig. 297A

Fig. 297B

| Price, Lothrop's Belt Awls | each 📒 | . 50 |
|----------------------------|------------|------|
| " Awl and Pliers Combined | • • • | . 40 |

BET GROOVER



Fig. 297C

Fig. 297D

| Price, Belt Groovers | each | .50 |
|--------------------------|------|------|
| | | |
| " "Markora 5 inches long | 66 | . 20 |
| " Markers, 5 inches long | | . 20 |

LACE LEATHER CUTTER







Fig. 297F

| Price | , Lace Le | ath | er Cutters, cuts 3/6 to 3/4 inches wide | . each | .50 |
|-------|-----------|-----|---|--------|------|
| ** | Cutters | for | Leather Belts | . " | .90 |
| 44 | 64 | 66 | Rubber Belts | | 1.25 |

RIVET SET

BELT KNIFE



00

0

 $10\overset{\frac{9}{32}}{12}$



Fig. 297G

Price....per doz. 9.00 9.00

Number.....

Size Hole...inches

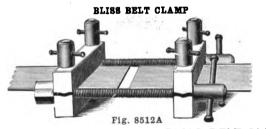
For Iron Rivets..lb. For Copper Rivets . . number

| RI | ET S | ETS | | . 118 | . 27111 | | |
|---------|-------|-------|--------|--------|---------|--------|-------|
| 1 | 2 | 3 | 4- | 5 | 6 | 7 | 8. |
| 17 8 | 3 Ga. | 9 Ga. | 15 Ga. | 21 Ga. | 27 Ga. | 33 Ga. | 39 Ga |
| 8 | 6 | 4-5 | 21/2-3 | 2 | 11/2 | 114 | 3∕4 |
| 6 | 7 | 8 | 9 | 10-11 | 12 | 13 | 14 |
| 7.50 | 7.50 | 6.00 | 6.00 | 4.50 | 4.50 | 3.75 | 3.75 |

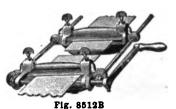
| - | | _ | KI | | | _ |
|---|-----|---|----|----|-----|---|
| - | - 1 | | - | ч. | w - | |

| O . | ••••• | |
|-------------|-------|----------------------|
| Price | | non dogon I 3 (M) |
| 11100.,,,,, | | Der ubzen i 5.00 |
| err. | | |

BELT TOOLS



GARDNER BELT CLAMP



BLISS BELT CLAMPS

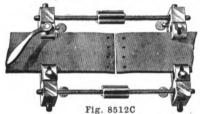
| Number | 621/2 | 63 | 64 | 65 |
|-------------------------------|-------|------------------|------------------|------------------|
| Width of Beltinches Priceeach | | 12 to 18 3.00 | 18 to 24 4.00 | 24 to 36 5.00 |

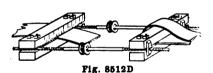
GARDNER BELT CLAMPS

| Width of Belt | inches | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 |
|---------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price | each | 14.00 | 18.00 | 22.00 | 26.00 | 30.00 | 34.00 | 38.00 | 44.00 |

PORTER BELT CLAMP

WESTON BELT CLAMP





PORTER BELT CLAMPS

| Width of Beltinches | 2 to 20 |
|------------------------------|---------|
| Price with 26-inch Screweach | 12.00 |
| " " 60 " " " ! | 15.00 |

WESTON BELT CLAMPS

| Width of Belt | inches | 8 | 10 | 12 | 14 | 16 | 20 | 24 |
|---------------|--------|-------|-------|-------|-------|-------|-------|-------|
| Price | each_ | 9.25 | 10.00 | 12.00 | 12.50 | 13.50 | 15.00 | 16.00 |
| Width of Belt | inches | 26 | 30 | 36 | 44 | 55 | 65 | |
| Price | each | 18.00 | 20.00 | 24.00 | 30.00 | 37.00 | 42.00 | |

ADJUSTABLE BELT PLANES



Fig. 8512E

| Price, A | djustable | Belt Planes | , 2 3% inch | Cutter | each | 2.00 |
|----------|-----------|-------------|--------------------|--------|----------|------|
| | | | | | | |

5.00

BELT TOOLS, ETC.

BELT LACING OUTFIT



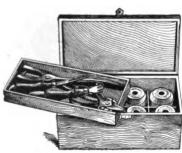




Fig. 7566A

BELT LACING OUTFIT

Price, Belt Lacing Outfit as shown: Finished brass-trimmed wooden case, an assortment of eight fifty-foot spools of composition wire lacing and tools used in applying it....

BELT SPLICING OUTFIT

Price, Belt Splicing Outfit as shown: Glue heater, glue pot, glue brush, one pound belt cement, belt plane, shave, knife, hammer, three scrapers and whetstone... 11.00 Separate parts furnished when desired.

EXCELSIOR WASHER CUTTER

CENTURY GASKET AND WASHER CUTTER





Fig. 7566C

EXCELSIOR WASHER CUTTERS

each 1.50

CENTURY GASKET AND WASHER CUTTERS

HARGRAVE WASHER CUTTER



Price, cut from 4 to 20 inches per dozen 20.00

Extra Knives. graduation 20.00

3.00

BELT LACING MACHINES

ECONOMY







Fig. 7348B

ECONOMY

| Number | 1 | 2 | 3 | 4 |
|----------------------|--------|--------|---------|---------|
| Will Lace Beltinches | 1 to 4 | 1 to 8 | 1 to 12 | 1 to 18 |
| Priceeach | 20.00 | 25.00 | 35.00 | 45.00 |

The price of the 4 and 8 inch machines, Nos. 1 and 2, include two boxes of Lace and Rawhide Pins for same. Nos. 3 and 4 prices include four boxes of Lace and Pins for same. Coil Lacing per box of 500 inches and Rawhide Pins for same, 1.00. Brass Lacing per box, 2.00. Needles, each .20. Cutting Pliers, each .90.

PEERLESS

| | | | 7 === == | | | |
|--------------------|-----------|--------|---------------------|---------|---------|---------|
| Sizeinch | es 4 | 6 | 8 | 12 | 18 | 24 |
| Will Lace Beltinch | es 1 to 4 | 1 to 6 | 1 to 8 | 1 to 12 | 1 to 18 | 1 to 24 |
| Price eac | h 55.00 | 65.00 | 75.00 | 85.00 | 110.00 | 135.00 |

Power attachment for 18 and 24-inch machines, 10.00. No. 4 machine is furnished with 4000 inches of Coil Lacing, Nos. 6 to 12 have 6000 inches, and Nos. 18 to 24 have 8000 inches of Lace. Coil Lacing, per box 1.00. Brass Lace, per box 2.00. Spiral Needles, 35 cents per dozen. Rawhide Pins, per bundle 2.00. Steel pins, 50 cents. Coupling Twine, 20 cents per ball. Cutting Pliers, per pair 1.50.



Fig. 7348Ç

CLIPPER BELT LACERS

| Price | No. | 1 Too | l, 6 inc | hes wide | (will la | ce any w | idth). | .each | 4.75 |
|-------|-----|-------|----------|------------|----------|-----------|--------|--------|------|
| 14 | " | 3 H | ooks | , for T | hin ! | Belts | per | 1000 | 1.50 |
| " | " | 4 | +6 | "1, | inch | Belt. | · " | 44 | 1.50 |
| " | " | 5 | 66 | - " á₹ | 66 | " | ** | 66 | 1.75 |
| | | | 66 | " 1% | 66 | " | " | 44 | 2.00 |
| " | Ra | whide | Pins, | 24 pieces, | 12 inc | hes long. | . per | bandle | .75 |

BELT DRESSING AND CEMENT

DIXON'S TRACTION BELT DRESSING







Fig. 6614A

Fig. 6614B

DIXON'S TRACTION BELT DRESSING

| Packages | 10.1h Paile | 95.ll Poile | 50.1h Kore | 100.lb Kore | 350 to 400-lb, bblg |
|-----------------|----------------|--------------|------------|------------------|---------------------------|
| Lackage | IO-III. I alls | 20-10. I ans | oo-m. mega | 100 m. negs | יפוניום ינווייסטב טו סססי |
| Deign | .60 | 50 | .45 | 45 | .36 |
| Price per pound | .00 | .50 | 64. | . 4 0 | . 30 |

DIXON'S SOLID BELT DRESSING

| Price, in one pound Sticks | per pour | nd .50 |
|----------------------------|----------|--------|

CLING SURFACE BELT FILLER



Fig. 6614C

BELT DRESSING



CLING SURFACE BELT FILLER

| Price, 10, 25 and 50-po | und Packages per pound .70 |
|-------------------------|------------------------------|
| | BELT DRESSING |
| Price | per pound .50 |
| | BELT CEMENT |
| Price | per pound 1.00 |
| | KUEISSER'S BELT CEMENT |



FLUE CLEANERS AND RODS

DUPLEX TUBE SCRAPER







KING TUBE SCRAPER



FARIES TUBE CLEANER



Fig. 928D

DUPLEX, ENGINEERS' FAVORITE, AND KING TUBE SCRAPERS

| Size inches | 13/4 | 2 | 21/4 | 21/2 | 23/4 | 3 | 31/4 | 31/2 | 334 | 4 |
|-------------|------|------|------|------|------|------|------|------|------|------|
| Priceeach | 2.00 | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 3.75 | 4.00 |

FARIES FIRE TUBE CLEANERS

| Size inches | | | | | | | | | | | | |
|------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Price, with Rameach without Ram. " | | | | 3.25 | 3.50 | 3.75 | 4.00 | 4.50 | 5.75 | 6.25 | 6.75 | 7.25 |
| " without Ram. " | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 4.00 | 5.00 | 5.50 | 6.00 | 6.50 |

FARIES WATER TUBE CLEANERS

| Size | inches | 31/2 | 4 | |
|-------|--------|------|------|--|
| Price | each | 5.00 | 5.65 | |

FOLDING RODS FOR BOILER TUBE CLEANERS Made of White Ash Wood



Fig. 928E

| Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|------------------------------------|------|----------------|----------------|------|------|------|------|------------|
| Length, First Section feet | 61/2 | 51/2 | 41/2 | 15 | 13 | 11 | 10 | 8 |
| " Second Section " | 61/2 | $5\frac{1}{2}$ | 41/2 | 6 | 6 | 6 | 5 | 5 |
| " Over All " | 13 | 11 | 9 | 21 | 19 | 17 | 15 | 13 |
| Priceeach | 5.76 | 5.60 | 5.44 | 6.40 | 6.24 | 6.08 | 5.90 | 5.76 |
| Number | 9 | 10 | 11 | 12 | !3 | 14 | 15 | |
| Length, 1st, 2d & 3d Sections feet | 7 | 61/3 | $5\frac{2}{3}$ | 5 | 41/3 | 32/3 | 3 | |
| " Over All " | 21 | 19 | 17 | 15 | 13 | 11 | 9 | |
| Pricecach | 8.40 | 8.24 | 8.08 | 7.92 | 7.76 | 7.60 | 7.44 | <u>.</u> . |

Coil Brush ...

FLUE CLEANERS

SPIRAL, FLAT WIRE







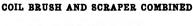
Fig. 1106A

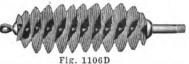
Fig. 1106B

Price, Spiral, Flat or Round Wire, Sizes 1 to 6 inchesper inch | 1.00

ELLIPTIC







| | rig. | 1100 |
|------|--------|------|
| Size | inches | 1 |

| Sizeinches | 1 | 11/4 | 11/2 |
|--------------|------|------|------|
| Ellipticeach | 2.00 | 2.00 | 2.00 |
| Coil Bruch " | 1.00 | 1.00 | 1.00 |

23/4 4.00 2.00

CRISS-CROSS FLUE CLEANERS ROUND

13/4

2.00

1.00



Fig. 1106E





Fig. 1106F

| Q: | inahaa | 11/ | 13/ | ຄ | 91/ | 91/ | 03/ | 9 | 21 | 21/ | 23 / 1 | 4 | 11/ | I 5 | l e |
|-------|------------|-------|------|-------|------|------|------|----------|------|------|--------|------|------|------|------|
| S126 | писиев | 172 | 1/4 | 4 | 4/4 | 4/2 | 474 | •> | 0.1 | 072 | 1074 | ** | 4/2 | יט | U |
| D : | | 63.00 | 0.00 | 12.00 | 0 00 | 0.50 | 0.55 | 0.00 | 0.05 | 0.50 | 0.55 | 4.00 | 4.50 | 5.00 | 0.00 |
| Price | incheseach | 2.00 | 2.00 | 2.00 | 2.20 | 2.50 | 2.75 | 3.00 | 3.20 | 3.50 | 3.15 | 4.00 | 4.00 | 5.00 | 6.00 |
| | | | | | | | | <u> </u> | | | | | | | |

FLAT

Price, with Handle (5 feet long)..... without Handle, but Coupling Attachment.....

2.00

Made in sizes $5\frac{1}{2}$ inches long by $3\frac{1}{2}$ inches wide by $1\frac{3}{4}$ inches thick; also $5\frac{1}{2}$ inches long by $3\frac{1}{6}$ inches wide by 1 inch thick. Adapted to nearly every style of sectional heater.

COMBINATION SCRAPER AND BRUSH







Fig. 1106G

Fig. 1106H

| Sizeinches | 11/2 | 2 | 21/4 21/2 | 234 | 3 314 | $31_2 + 33_4$ | 4 | 41/2 |
|-------------------------|------|------|------------|------|--------------------------|---------------|------|------|
| Price, Combination each | 1.90 | 2.50 | 2.85, 3.15 | 3.45 | $3.75 \ \overline{4.10}$ | 4.40 4.70 | 5.00 | 5.65 |
| " Ingalls' " | 1.50 | 2.00 | 2.25 2.50 | 2.75 | 3.00 3.25 | 3.50 3.75 | 4.00 | 4.50 |



Fig. 929A

| Tube inches | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 |
|-------------------------------------|---|----------------|----------------|------|---|------|---|
| Price, with Handle each without " " | | | 14.50 11.00 | | | | |



11/4 to 21/4 Tube.....inches 21/2 to 31/4 31/4 to 51/2 9.00 12.00 14.00



| Tubeinches | $\frac{34}{4}$ to $1\frac{1}{4}$ | $1\frac{1}{4}$ to $2\frac{1}{4}$ | 2½ to 3½ | 4 to 5 |
|------------|----------------------------------|----------------------------------|----------|--------|
| Priceeach | 7.50 | 8.00 | 9.00 | 10.00 |



Tube inches 2 to 214 2½ to 2¾ 3 to 31/4 3½ to 3¾ 4 to 41/2 5 to 6 Price.....each 5.006.257.50 8.75 10.00 12.50

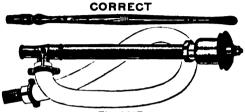


Fig. 929E

| Tube | inches. | 2, 214, 212, 23 | 3, 31/4, 31/2, 4 | 5 and 6 |
|-------|---------|-----------------|------------------|---------|
| Price | each | 10.00 | 12.00 | 16.00 |

BOILER TUBE CLEANERS

TURBINE. OPERATED BY WATER POWER POD WATER THER BOILERS



Fig. 6639A

| Number | 1 | 2 | 6 | 7 | 8 |
|----------------------|---|------|--------|------|---|
| Size of Tubes:inches | | 31/2 | Curved | 31/2 | 4 |

Numbers 1 and 2 have malleable iron case and water wheel, other parts are of steel. Number 6 is adapted for all sizes of curved tubes.

Numbers 7 and 8 are made extra strong and from the best steel and phosphorbronze.

Cutter Wheels are furnished with cleaners best adapted for requirements.

DEAN, OPERATED BY AIR OR STEAM APPLICATION ON WATER TUBE BOILER APPLICATION ON RETURN TUBULAR BOILER

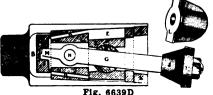




Fig. 6639B

SECTIONAL

Fig. 6639C



| | 218. 00002 | | | | | | | | | | |
|-----------------|------------|-------|-------|--------|--------|-------|-------|-------|-------|----------------|--------|
| Number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | *10 |
| For Tubesinches | 41/2 | 4 | 31/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | $\overline{6}$ | |
| Price each | 70.00 | 65.00 | 65.00 | 100.00 | 100.00 | 75.00 | 75.00 | 75.00 | 80.00 | 90.00 | 100.00 |

•No. 10 for Stirling boiler curved tubes.

Nos. 0, 1 and 2 are old style steel shell and the others are the improved brass shell machines.

The Dean is two cleaners in one, adaptable to either water tube or return tubular boilers by merely changing the vibrator. When equipped with extra attachments may be operated in two or more different sizes of tubes within certain limitations. This cleaner combines a scale remover and soot cleaner, the vibrations dislodging the scale also jars off the hard baked soot that cannot be removed by the ordinary soot blowers. The Dean delivers from 3000 to 8000 taps per minute with a force varying from $1\frac{1}{16}$ to $3\frac{1}{2}$ foot ounces, while the taps are not heavy enough to injure the tubes they produce sufficient tremor to loosen and dislodge the heaviest and most tenacious scale. The tremor s localized to the point where the cleaner is at work and does not extend the whole length of the tube as each vibration is neutralized by the one succeeding.

TUBE EXPANDERS AND CUTTERS

STANDARD ROLLER TUBE EXPANDER DUDGEON TYPE

"DAYTON" ROLLER TURE EXPANDER ROSS TYPE





STANDARD ROLLER TUBE EXPANDERS, DUDGEON TYPE

| Sizeinches | 1 to 2 | 21/8. 21/4 | 21/2 | 234 | 3 | 31/4 | 31/2 |
|--|-----------------|----------------------|-----------------------------|---------------|----------------|-----------------------|----------------|
| Priceeach "Mandrels" | 10.00 2.50 | $\frac{12.00}{3.00}$ | 14.00 3.50 | 16.00 3.50 | 18.00 4.00 | 20.00 4.50 | 23.00 5.00 |
| " Rollers, per set of three Sizeinches | 33/4 | 1.15 | $\frac{1.30}{4\frac{1}{4}}$ | 1.45 | 1.60 | 51/2 | 2.00 |
| Priceeach " Mandrels" | $25.00 \\ 5.75$ | 30.00 6.50 | 35.00 8.00 | 40.00 8.00 | 50.00 10.00 | $\frac{55.00}{12.50}$ | 60.00 15.00 |
| " Rollers, per set of three | 2.25 | 2.50 | 3.50 | 3.50 | 4.00 | 4.50 | 5.00 |

"DAYTON" ROLLER TUBE EXPANDERS, BOSS TYPE

| Sizeinches Priceeach | $\frac{1 \text{ to } 13\cancel{4}}{11.00}$ | $\frac{17\%}{12.50}$ | $\frac{2}{13.00}$ | $\frac{2\frac{1}{8}}{15.00}$ | $\frac{2\frac{1}{4}}{15.50}$ | $\frac{2^3 s}{16.50}$ | $\frac{2\frac{1}{2}}{17.00}$ | $\frac{25}{8}$ 18.00 | $\frac{2\sqrt[3]{4}}{19.00}$ | 3 20.00 |
|-------------------------|--|----------------------|-------------------|------------------------------|------------------------------|------------------------|------------------------------|------------------------|------------------------------|------------|
| Sizeinches Priceeach | 31/4 | 31/2 | 33/4 | 4 | | Ī | | | | |

WIEDEKE IDEAL SELF FEED TUBE CUTTER WIEDEKE IDEAL SELF FEED TUBE EXPANDER





Fig. 7796C

Fig. 7796D WIEDEKE IDEAL SELF FEED TUBE CUTTERS

| For Tubes, Diameter inches | $2,21_{4},21_{2}$ | 23/4 | 3,31/4 | $3\frac{1}{2}, 3\frac{3}{4}, 4$ | 414,41/2 | 5,51,2,6 |
|----------------------------|-------------------|-------|--------|---------------------------------|----------|----------|
| Priceeach | 14.00 | 16.00 | 20.00 | 22.00 | 30.00 | 32.00 |

EXTENSIONS FOR WIEDEKE IDEAL-SELF FEED TUBE CUTTERS

| Number | A1 | A2 | B3 | B4 | $\mathbf{B5}$ | B6 | C7 | C8 |
|-------------------------------------|---------------------------|-------------------------|----------|----------|---------------|-----------|-----------|-----------|
| For Cutters, sizes, inches | $2 \text{ to } 2^{3}_{4}$ | $\overline{2}$ to 2^3 | 3 to 41, | 3 to 414 | 3 to 41/4 | 3 to 414 | 41/2 to 6 | 11/2 to 6 |
| Length of Extension " | 19 | 38 | 19 | 38 | 72 | 96 | 19 | 38 |
| Price, Frame and Rod Complete, each | 3.80 | 8.00 | 4,50 | 10.00 | 15.00 | 18.00 | 7.00 | 15.00 |

WIEDEKE IDEAL SELF FEED TUBE EXPANDERS

| Diameter i | | | | | | | | | | | | |
|------------|---------|------|----------------|---------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price | | | | | | | | | | | | |
| Diameteri | nches 2 | 23 8 | $2\frac{1}{2}$ | $2^{5}\stackrel{\checkmark}{s}$ | 234 | 3 | 31/4 | 31/2 | 33/4 | 4 | 41/4 | 41/2 |
| Price | each 19 | 3.50 | 19.50 | 22.00 | 22.00 | 22.00 | 24.50 | 24.50 | 27.00 | 27.00 | 37.00 | 39.50 |

MAGIC

HOSE GARDEN





Fig. 1703A

Fig. 1703B

| Size | 1/2 | 5 8 | 3/4 |
|----------------------|-----|-----|-----|
| Price, 2-plyper foot | .25 | 28_ | .30 |

Made in continuous lengths up to 500 feet. Light, strong, flexible, non-kinking. 1846 PARA DOUBLE DIAMOND



Fig. 1703C WIRE WOUND



Fig. 1703D COTTON RUBBER LINED

Fig. 1703E

Fig. 1703F

Made up in 25 and 50-foot lengths with couplings. Sizes, 1/2, 5/8, and 3/4-inch. Net. prices on application.

MAGIC AIR DRILL AND PNEUMATIC TOOL AIR DRILL



PNEUMATIC



Fig. 1703H

| Diameter, Insideinches | 3/8 | 1/2 | 5/8 | 3/4 | 1 | 11/4 | 11/2 |
|------------------------|-----|-----|-----|------|------|------|------|
| Price, 2-plyper foot | .43 | .47 | .52 | .57 | .70 | .85 | 1.02 |
| " 3 " | .51 | .56 | .64 | .71 | .87 | 1.04 | 1.25 |
| " 4 " " | .63 | .70 | .79 | .87 | 1.07 | 1.30 | 1.56 |
| " 5 " " | .76 | .84 | .95 | 1.05 | 1.28 | 1.56 | 1.87 |

Regularly made in 500-foot lengths in sizes 1-inch and under; 200-foot lengths in larger sizes.

WATER HOSE





PRICE, PER FOOT Internal Diameter Inches 6- Ply 2-Ply 5-Ply 3-Ply 4-Ply .20 .25 .33 .25 .30 .30 .37 .45 .37 .46 55 .40 .50 62 75 .42 50 .50.60 134 2 214 21/2 23/4 3 31/2 4 5 6 .58.66 .75 92 99 1.20 1.16 1.40 3.00 1.32 2.00 2.501.60 1.65 2.00 2.50 3.13 3.75 2.403.00 1.98 3.75 4.50

Furnished with round, half oval, or flat wire wrapping, when desired.

CARBON

HOSE

DOUBLE DIAMOND





Pig. 1706A

1846 PARA

Fig. 1706B



Fig. 1706C

| Size | ••••• | .inches | 1/2 | 34 | 1 | 114 | 11/2 | 13/4 | 2 | 21/4 | 21,2 |
|--------|-------|----------|------|------|------|------|------|------|------|------|------|
| Price, | 3-ply | per foot | .47 | .57 | .70 | .85 | 1.02 | 1.18 | 1.34 | 1.50 | 1.66 |
| 44 | 4 "" | - " | .56 | .71 | .87 | 1.04 | 1.25 | 1.45 | 1.66 | 1.87 | 2.08 |
| 44 | 5 " | " | .70 | .87 | 1.07 | 1.30 | 1.56 | 1.81 | 2.07 | 2.33 | 2.60 |
| 86 | 6 " | ** | .84 | 1.05 | 1.28 | 1.56 | 1.87 | 2.17 | 2.49 | 2.80 | 3.12 |
| # | 7 " | 66 | .98 | 1.23 | 1.50 | 1.82 | 2.18 | 2.53 | 2.90 | 3.27 | 3.64 |
| 44 | 8 " | 46 | 1.12 | 1.41 | 1.70 | 2.08 | 2.50 | 2.90 | 3.32 | 3.74 | 4.16 |

WIRE WINDING HOSE WITH ROUND TINNED STEEL WIRE WATER AND PNEUMATIC TOOL

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 1½ | 13/4 | 2 | 21/4 | 21/2 |
|-----------------------|--------|--------|-----|--------|--------|------|-----|------|------|
| Price, 3-plyper foot | .03 | .03 | .04 | .05 | .06 | .07 | .08 | .09 | .10 |
| " '4 [*] " " | .03 | .031/2 | .05 | .06 | .071/2 | .09 | .10 | .11 | .12 |
| " 5 " " | .031/2 | .041/2 | .06 | .071/2 | .09 | .11 | .12 | .14 | .15 |
| " 6 " " | .04 | .05 | .07 | .09 | .11 | .13 | .15 | .17 | .18 |

WIRE WINDING HOSE WITH ROUND TINNED STEEL WIRE STEAM AND AIR DRILL

| CIDAM AND AIR DRIDE | | | | | | | | | | |
|----------------------|-----|--------|------------------|--------|------------------|--------|-----|------|------|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 13/4 | 2 | 21/4 | 21/2 | |
| Price, 3-plyper foot | .04 | .05 | $.06\frac{1}{2}$ | .081/2 | .10 | .111/2 | .13 | .15 | . 16 | |
| " 4 " " | .05 | .061/2 | .08 | .10 | $.12\frac{1}{2}$ | .14 | .16 | .18 | .20 | |
| " 5 " " | .06 | .08 | .10 | .13 | .15 | .18 | .20 | .23 | .25 | |
| " 6 " " | .07 | .10 | .12 | .15 | .18 | .21 | .24 | .28 | .30 | |

WIRE WINDING HOSE WITH HALF-ROUND OR FLAT WIRE WATER AND PNEUMATIC TOOL

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 13/4 | 2 | 214 | 21/2 |
|-----------------------|--------|--------|-----|------------------|------|--------|-----|------------------|------|
| Price, 3-plyper foot | .06 | .06 | .08 | .10 | .12 | .14 | .16 | .18 | .20 |
| 4 4 " | .06 | .06 | .08 | .10 | . 12 | .14 | .16 | .18 | .20 |
| " 5 " " | .071/2 | .071/2 | .10 | $.12\frac{1}{2}$ | . 15 | .171/2 | .20 | $.22\frac{1}{2}$ | .25 |
| " 6 " " | .09 | .09 | .12 | .15 | .18 | .21 | .24 | .27 | .30 |

WIRE WINDING HOSE WITH HALF-ROUND OR FLAT WIRE STEAM AND AIR DRILL

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 13/4 | 2 | 214 | 21/2 |
|--|--------|--------------------|-------------------|----------------------------------|--|----------------------|-------------------|---------------------------------|--------------------|
| Price, 3-plyper foot " 4 " " " " 5 " " " | .09 | .09 | .12 .12 .15 | .15 .15 .18 ³ 1 | .18 .18 .22½ | .21 .21 .261/4 | .24 .24 .30 | .27 .27 .333 ₄ | .30 .30 .37½ |
| _ " 6 " " | .131/2 | $.13\frac{1}{2} $ | .18 | 221/2 | $\begin{bmatrix} .22/2 \\ .27 \end{bmatrix}$ | .311/2 | | $.40\frac{1}{2}$ | .45 |

HOSE COTTON RUBBER LINED DOURLE JACKET FIRE "AFMIC" UNDERWRITERS



Fig. 1710A Special prices on application. CARBON MILL



Fig. 1710B



UNDERWRITERS' LINEN



Fig. 1710C

COTTON MILL

Fig. 1710D

| Sizeinches | 11/4 | 11/2 | 2 | 21/2 | | | | |
|---------------|------|------|-----|------|--|--|--|--|
| Priceper foot | .45 | .50 | .65 | .80 | | | | |
| LINEN | | | | | | | | |

Size.....inches 11/6 21% Price, Unlined per foot
"Rubber Lined " .30 .24.37 .40 .36 .40 .44 .54 59 .65



ENGINE AND TENDER



Fig. 1710E



AIR BRAKE AND SIGNAL

| Sizeinchés | 1 | 11/4 |
|-----------------------|------|------|
| Price, 3-plyper foot | .70 | .85 |
| " '4 ⁻ " " | .87 | 1.04 |
| ." 5 " " | 1.07 | 1.30 |

ENGINE AND TENDER

| Sizeinches | 2 | 21/4 | 21/2 |
|--|------|------|------|
| Price, 3-ply | .80 | .90 | 1.00 |
| " 4 ["] " " " " " " " " " " " " " " " " " " " | 1.00 | 1.12 | 1.25 |

HOSE, ETC. SUCTION HOSE 8MOOTH BORE

PLAT WIRE HELIX

ROUND WIRE HELIX





Fig. 1032A

Fig. 1032B

Smooth bore suction hose has the wire helix imbedded in the

Smooth bore suction hose has the wire helix imbedded in the walls, the rubber tube entirely covering it, making a perfectly smooth waterway, offering no obstruction to the fluid.

| Diameter, Insideinches | | | | | | | | |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Priceper foot | 2.60 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 | 8.50 | 9,50 |
| Diameter, Insideinches | 6 | 61/2 | 7 | 71/2 | . 8 | 9 | 10 | 12 |
| Priceper foot | 10.50 | 12.00 | 13.50 | 15.00 | 16.50 | 19.50 | 22.50 | 27.50 |

WIRE LINED

Wire lined suction hose is constructed in the same manner as smooth bore, excepting that the wire helix is not imbedded. This style of construction enables us to furnish suction hose suited to pumping clear fluids at a reduced cost.

| Dia., Inside inches | 3/4 | 1 | 11/4 | 11/2 | 13/4 | 2 | $=$ $2\frac{1}{2}$ | 3 | $3\frac{1}{2}$ | 4 | 41. |
|---------------------|------|------|------|-------|-------|-------|--------------------|--------------------|----------------|-------|------|
| Priceper foot | . 70 | .90 | 1.15 | 1.50 | 1.90 | 2.30 | 3.10 | 4.00 | 4.90 | 5.80 | 6.70 |
| Dia., Inside inches | | | | | | | | | 10 | 12 | |
| Priceper foot | 7.60 | 8.50 | 9.50 | 10.50 | 12.00 | 13.50 | 15.00 | $\overline{17.50}$ | 20.00 | 25.00 | |

DREDGING SLEEVES



Fig. 1032C

Dredging sleeves are used to form a flexible connection between sections of iron pipe forming a line from the dredge in the river or harbor to the land, through which the material pumped is discharged.

Prices on application.



PHOSPHATE HOSE

COMBINATION

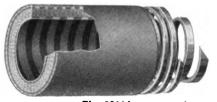


Fig. 2244A

SUCTION





Fig. 2244B

DISCHARGE



Fig. 2244C

The above illustrations describe the various classes of hose specially built to meet conditions in the hydraulic mining of phosphate. The general design and construction is the result of many years' experience necessary to determine the class of hose which will give the best service The three classes of hose shown are adapted for service as follows: combination for both suction and discharge or between centrifugal pumps operating in tandem; hydraulic hose for use on the water lines, between the pressure pump and the hydraulic giant or nozzle; the suction and discharge hose being used in connection with the centrifugal mining pump. The above hose can be furnished with extra heavy or standard nipples and also with plain or our patent extra heavy hook band.

Prices on application.

DRIFT



Fig. 2244D

The above illustration shows what is termed Phosphate Drift Hose used in connection with the Hydraulic System for mining phosphate. This hose is furnished in 11/2, 2 and 21/2 inches inside diameter, wire inserted and outside wire wound and suitable for water pressures of 150 and 175 pounds.

Special prices on application.

METAL HOSE

B. D. No. 15





Fig. 2059A Fig. 2059B

B. D. No. 15 STEEL HOSE

For Oils, Gasoline, Etc., Ordinary Pressures

| Internal Diameterinches Priceper foot | 3/16 | 34 | 5/6 | 3/8 | 1/2 | 5/8 | 3/4 | 1 | 114 | 114 | 2 |
|---------------------------------------|------|------|-----|-----|-----|-----|-----|---|-----|-----|---|
| | | | | | | | | | | | |
| Internal Diameterinches | 21/2 | 3 | 312 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | |
| Priceper foot | 3.20 | 3.55 | | | | | | | | | |

B. D. No. 15 COPPER HOSE For Steam Ordinary Pressures

| | | | | <u> </u> | | | | | | | |
|-------------------------|------|------|------|----------|-------------------|------|------|-------------------|------|------|------|
| Internal Diameterinches | 3/16 | 1/4 | 5/6 | 3 🐇 | 1/2 | 5/8 | 3/4 | 1 | 11/4 | 11/2 | 2 |
| Priceper foot | .50 | .60 | .75 | 1.25 | $\overline{1.50}$ | 1.80 | 2.05 | $\overline{2.65}$ | 3.20 | 4.25 | 5.65 |
| Internal Diameterinches | 212 | 3 | 31/2 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | |
| Priceper foot | 6.75 | 7.90 | | | | | | | | | |

B. D. No. 20 STEEL HOSE WITH SINGLE STEEL BRAIDING For Oils and Steam, Heavy Pressures

| Internal Diameter inches | 3/16 | 14 | 5/16 | 3/8 | 1,2 | 5/8 | 34 | 1 | 11/4 | 11/2 | 2 |
|--------------------------|------|------|------|-----|-----|------|------|------|------|------|------|
| Priceper foot | .45 | 50 | .60 | 70 | 80 | 1.00 | 1.20 | 1.70 | 2.10 | 2.75 | 3.50 |
| Internal Diameter inches | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | |
| Priceper foot | 4.20 | 5.80 | | | | | | | | | |

B. D. No. 20 COPPER HOSE WITH SINGLE COPPER BRAIDING For Gasoline and Heavy Steam Pressures

| Internal Diameterinches | 3/16 | 1/4 | 5/6 | 3/8 | 1/2 | 5/8 | 3⁄4 | 1 | 114 | 11/2 | 2 |
|-------------------------|----------------|-------|----------------|------|------|------|------|-----------|------|------|------|
| Priceper foot | .70 | .85 | 1.00 | 1.50 | 1.75 | 2.25 | 2.50 | 3.70 | 4.85 | 6.30 | 8.40 |
| Internal Diameterinches | $2\frac{1}{2}$ | 3 | $3\frac{1}{2}$ | 4 | 5 | 6 | 7 | 8 | 10 | 12 | |
| Priceper foot | 10.00 | 14.00 | | | | | | • • • • • | | | |

Net prices for sizes 31/2 to 12 quoted on application.

COUPLINGS

Soldered couplings should never be used on steam hose or for any purpose where the heat is sufficient to soften solder.

Steam couplings are packed on with asbestos and red lead, and will stand heavy pressure and high heat.

| I. P. Tinches | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 | 3/4 |
|-------------------------------------|------|---------------------|--------------|----------------------|---------------|----------------------|
| Price, Soldered per set " Packed " | | | | | | |
| I. P. Tinches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
| Price, Solderedper set "Packed" | | $\frac{2.50}{5.50}$ | 3.00 7.50 | $\frac{3.50}{12.00}$ | 5.00 16.00 | $\frac{6.50}{24.00}$ |

Larger sizes on application.

All couplings furnished either with or without flexible reinforced ends.

HOSE COUPLINGS AND MENDERS

ŚPUN % and %-Inch

PLAIN
1-Inch and Smaller

LUG 1%-Inch and Larger







Fig. 942A

Fig. 942B HOSE_COUPLINGS

Fig. 942C

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 |
|---|----------------|--------------|--------------|----------------|----------------|----------------|----------------|
| Price Hose Thread, per dozen "Pipe Thread." | 2.40 2.65 | 2.40 2.65 | 4.40 4.65 | 10.00 10.50 | 14.00 15.00 | 24.00 26.00 | 48.00 50.00 |
| Size inches | 3 | 3½ | 4 | 5 | 6 | 8 | |
| Price, Hose Thread, per dozen "Pipe Thread" | 75.00 76.00 | 120.00 | 150 00 | 250.00 | 350.00 | 504 00 | |

STEAM







Fig. 942D STEAM HOSE COUPLINGS

Fig. 942E

| Sizeinches | | | | | | | |
|----------------------|-------|-------|-------|-------|-------|-------|-------|
| Hose Threadper dozen | 15.00 | 15.00 | 18.00 | 24.00 | 30.00 | 42.00 | 72.00 |
| Iron Pipe Thread " | 15.00 | 15.00 | 18.00 | 24.00 | 30.00 | 42.00 | 72.00 |
| | 10.00 | | | | | | |
| " " Iron Pipe " " | 10.35 | 10.35 | 12.75 | 17.00 | 21.50 | 30.00 | 50.00 |

ROCK DRILL HOSE COUPLINGS

| Sizeinches | 3/4 | 1 |
|------------|------|------|
| Priceeach | 5.25 | 6.00 |

Note: All Hose Couplings, 1-inch and larger will be furnished with iron pipe thread unless otherwise specified. If Hose Thread is desired, sample should accompany order.

HOSE MENDERS

SPECIAL MENDER CLAMP



IRON





Fig. 942F

Fig. 942G

Fig. 942H

| Sizeinches | 1/2 | 3/4 | 1 |
|--------------------------|------|------|------|
| Price, Ironper dozen | .60 | . 75 | 1.00 |
| " Brass " | 1.20 | 1.20 | |
| " Special Mender Clamp " | 2.40 | 2.40 | |

HOSE COUPLINGS AND BANDS

EXPANSION RING COUPLING

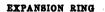






Fig. 5566A

Fig. 5566B

| Sizeinches | 11/2 | 2 | 21/2 |
|--------------|------|------|------|
| Priceper set | 2.00 | 2.50 | 3.00 |

Couplings furnished with Iron Pipe Thread unless otherwise specified.

BRASS

STEEL.

HOSE CLAMPS WALKER

VIRR JAW









Fig. 5566C

F1g. 5566D

Fig. 5566E BRASS OR STEEL HOSE CLAMPS

Pig. 5566F

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 |
|----------------|---------|---------|------|------|------|------|------|
| Hose Ply | 2, 3, 4 | 2, 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 | 3, 4 |
| Brassper dozen | .60 | .60 | 2.00 | 2.50 | 3.00 | 4.00 | 7.00 |
| Steel " | 1.00 | 1.00 | 1.50 | 2.50 | 3.00 | 4.00 | 7.00 |

WALKER BRASS OR STEEL HOSE CLAMPS

| | ALIKEII | D11733 | <u> </u> | | - OEAIII | | |
|-----------------|------------|------------|------------|------------|------------|------------|------------|
| Sizeinches | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 |
| Hose Ply | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 |
| Brass per dozen | .70 | .70 | 1.90 | 2.40 | 2.84 | 3.80 | 6.20 |
| Steel " | .50 | .50 | .80 | 1.25 | 1.60 | 2.00 | 2.40 |

WALKER VISE JAW HOSE CLAMPS

Price, for all Plys of Hose, (state size and ply of hose)....each 1.00

BRASS OR STEEL STEAM HOSE CLAMPS

| Size inches | | 1 | 114 | 11/2 | 2 |
|----------------|------------|------------|------------|------------|------------|
| Hose Pty | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 | 3, 4, 5, 6 |
| Brassper dozen | 1.90 | 2.40 | 2.85 | 3.80 | 6.20 |
| Steel " | .80 | 1.25 | 1.60 | 2.00 | 2.40 |

CALDWELL HOSE STRAPS

| Hose inches | 1/2 | 1/2 | 3/4 | 34 | 1 | 1 | 114 | 11/4 | 11/2 | 11/2 |
|--------------------------------|-------------|------------|-----------|-------------------|-----|--|-----------|------|--------------------|-----------------------|
| Lengthinches Priceper dozen | 33/8 .40 | 384 .40 | 4½ .60 | $\frac{434}{.60}$ | .80 | $\begin{array}{c} 5\frac{3}{8} \\ .80 \end{array}$ | 6 1.00 | | $\frac{634}{1.20}$ | $7\frac{1}{8}$ 1.20 |

HOSE STRAP FASTENERS

| Size | ine | hes 1/2 to 1 11/4 to 11/2 |
|-------|-----|---------------------------|
| Price | e | ach .50 .75 |

HOSE FITTINGS

BUSHING

REDUCER

MALE NIPPLE

MALE AND FEMALE NIPPLE









Fig. 7051C



Fig. 7051D

HOSE BUSHINGS AND REDUCERS

| Size .inches | 1 x ½ | 1 x 34 | 11/4 x 3/4 | 1¼ x 1 | 1½ x ¾ | 1½ x 1 | 1½x1¼ | 2 x 3/4 | 2 x 1 |
|--------------|----------|--------|------------|--------|--------|-----------------------------|--------|---------|----------|
| Per dozen . | 5.50 | 6.50 | 8.00 | 10.00 | 11.50 | 11.50 | 12.00 | 13.00 | 14.00 |
| Size .inches | 2 x 11/4 | 2 x 1½ | 2½ x ¾ | 2½ x 1 | 2½x1¼ | $2\frac{1}{2}x1\frac{1}{2}$ | 2½ x 2 | 3 x 2 | 3 x 21/2 |
| Per dozen | 16.00 | 18.00 | 20.00 | 22.00 | 23.00 | 24.00 | 26.00 | 30.00 | 36.00 |

MALE OR MALE AND FEMALE HOSE NIPPLES

| Sizeinches | 1.6 | 3 4 | 1 | 117 | 114 | 9 914 | 2 . | 314 | .1 |
|----------------|------|------|------|------|-------|---------------|-------|---------------|-------|
| Diac | /2 | /+ | | *.4 | 1/2 | 2 1 273 | | 072 | - |
| | | | | | | | | | |
| Priceper dozen | 3.50 | 3 50 | 5.00 | 0.00 | 10.00 | 14 00 . 28 00 | 40 00 | 50 00 | 75.00 |
| Tricepcr dozen | 0.00 | 0.00 | 0.00 | 0.00 | 10.00 | 17.00 20.00 | 30.00 | 6 0.00 | 10.00 |

In ordering any of the above goods, specify whether hose or iron pipe thread is required.

BIBB END



GOOSE NECK SCREW



SPRINKLER



Fig. 7051E

Fig. 7051P BIBB ENDS, GOOSE NECK SCREWS

Fig. 7051G Fig. 7051H

| Sizeinches | 1/2 | 5/8 | 3/4 | 1 | 1!4 | 11/2 | 2 |
|--------------------------------|------|------|------|------|------|-------|-------|
| Price, Hose Bibb Endsper dozen | 3.00 | 3.60 | 4.20 | 6.00 | 9.00 | 12.00 | 18.00 |
| " Goose Neck Screws " | | | 5.00 | | | | |

HOSE SPANNERS, MALLEABLE IRON

| Sizeinc | hes | 114 | 11/2 | 2 | 21/2 |
|----------|-----|-----|------|-----|------|
| Price ec | ach | .12 | .15 | .20 | .25 |

SPRINKLERS

| Diameterinches | | | | |
|------------------------------------|----------------------------|-------------|-----------|------------|
| Size Thread inches Price per dozen | $\frac{\frac{3}{4}}{4.50}$ | 3/4 5.25 | 1 6.00 | 1½ 9.00 |



HOSE FITTINGS. ETC.









HOSE REDUCER

FIR. 945A Pig. 945B

Pig. 945C

BRASS HOSE STRAINERS

| Sizeinches | 2 | 21/2 | 3 | 4 | 5 | 6 |
|------------|------|------|-------|-------|-------|-------|
| Price each | 7.50 | 8.50 | 10.00 | 19.00 | 31.00 | 46.00 |

In ordering, specify whether hose or iron pipe thread is required.

HOSE CAPS

| Size inches | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|----------------|------|------|------|-------|-------|-------|-------|-------|-------|
| Priceper dozen | 4.00 | 6.00 | 8.00 | 10.00 | 15.00 | 24.00 | 31.00 | 39.00 | 43.00 |

Sample of hose thread required must be furnished with order.

HOSE REDUCERS

| Sizeinches | 1x34 | 11/4×3/4 | 11/4×1 | 1½x¾ | 1½x1 | 11/2×11/4 | 2x3/4 | 2x1 | 2x11/4 |
|----------------|--------|----------|--------|--------|--------|-----------|-------|--------|--------|
| Priceper dozen | 6.50 | 8.00 | 10.00 | 11.50 | 11.50 | 12.00 | 13.00 | 14.00 | 16.00 |
| Sizeinches | 2x11/2 | 2½x¾ | 2½x1 | 2½ x1¼ | 2½ x1½ | 2½x2 | 3x2 | 3x21/2 | Ī |
| Priceper dozen | 18.00 | 20.00 | 22.00 | 23.00 | 24.00 | 26.00 | 30.00 | 36.00 | |

When ordering any of the above goods, always specify whether hose or iron pipe thread is required.

SIAMESE COUPLINGS AND CONNECTIONS







Fig. 945E



Fig. 945F

| | | COUPLINGS | | | | | |
|---|---|-----------|--|--|--|--|--|
| _ | | | | | | | |
| | 1 | :I | | | | | |

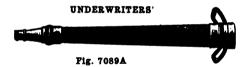
| Size, Iron Pipeinches | 4 | 31/2 | 3 | $2\frac{1}{2}$ | 2 | 11/2 |
|---------------------------|----------------|----------------|-------------------------|----------------|---|------|
| Size, both Nozzles inches | $2\frac{1}{2}$ | $2\frac{1}{2}$ | 2^{1} 2 $\frac{1}{2}$ | $2\frac{1}{2}$ | 2 | 11/2 |

On account of the wide variance of threads the couplings are made to order only. Prices on application. CONNECTIONS

| OUNITED NO. | | |
|---------------------------|---|-------|
| Size, Iron Pipeinches | 3 | 4 |
| Size, both Nozzles inches | | 21/2 |
| Price each | | 18.00 |

These connections are threaded Chicago Fire Department Standard. nish any thread desired on receipt of sample.

HOSE PIPES





Pig. 7089B

UNDERWRITERS' HOSE PIPES

| Sizeinches | 2 | 21/2 | 21/2 | 21/2 |
|--|------|-------|-------|-------|
| Lengthinches | 20 | 24 | 30 | 36 |
| Price. Wound and Painted each | 9.00 | 11.00 | 12.00 | 15.00 |
| " Plain Brass " Rubber Tube, Swivel Handles" | 7.50 | 9.50 | 11.00 | 13.50 |
| " Rubber Tube, Swivel Handles" | | | 15.00 | 18.00 |
| " Leather " " "" | | | | 18.00 |

HOSE PIPES, SCREW TIP

| Sizeinches | 3/4 | 3/4 | 1 | 1 | 11/4 | 11/4 | 11/2 | 11/2 |
|---|-----|-----|---|------|------|------------------------|------|----------------------|
| Length inches Price, Hose Thread per dozen " Pipe " " | | | | | | 15 24.00 25.00 | | 15 30.00 32.50 |
| Sizeinches | 2 | 2 | 2 | 21/2 | 21/2 | 21/2 | 21/2 | 21/2 |
| Lengthinches Price, Hose Thread per dozen " Pipe " " | | | | | | 24 100.00 103.50 | | |



Fig. 7089C





WITH COCK

Fig. 7089D

PLAIN HOSE PIPES

| Sizeinches | | | | | | | | | | 21/2 | |
|---|--|---------------|---------------|----------------------|-----------------------|---|--------------------------------|----------------------|----------------------|----------------------|----------------------|
| Lengthinches Hose Thread per doz. Iron Pipe " " | $ \begin{array}{c c} 3 & 6 \\ 4.00 & 7.00 \\ 5.00 & 8.00 \end{array} $ | 9.00 10 00 | 12.00 13.75 | 12 18.00 19.75 | 534 18.00 19.75 | $egin{array}{c} 12 \ 22.00 \ 24.00 \end{array}$ | $6\frac{3}{4}$ 26.00 29.00 | 12 34.00 39.00 | 7½ 37.40 39.50 | 12 55.00 60.00 | 20 90.00 92.00 |

HOSE PIPES, WITH COCK

| Sizeinches | 3/4 | 3/4 | 3/4 | 1 | 1 | 11/4 | 11/2 |
|--|---|-----|------------------------|------|---|------|------------------------|
| Length inches Hose Thread per dozen Pipe " " | $\begin{array}{c} 63/4 \\ 11.00 \\ 12.20 \end{array}$ | | $12 \\ 18.00 \\ 19.20$ | | $ \begin{array}{c c} 12 \\ 20.00 \\ 23.00 \end{array} $ | | 00.00 |
| Sizeinches | 2 | 2 | 2 | 21/2 | 21/2 | 21/2 | 21/2 |
| Lengthinches Hose Threadper dozen Pipe "" | | | 130.00 | | | | 36 215.00 225.00 |



GEM HOSE NOZZLES

| Sizeinches | 3/4 | 1 |
|----------------|-------|-------|
| Priceper dozen | 10.00 | 15.00 |

SWINGING HOSE RACKS

HIIMP

ECLIPSE

ROYAL

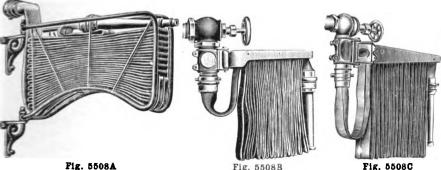


Fig. 5508A

Fig. 5508C

HUMP

| Number | AO | ĀOX | AOO | Al | AIX | Ã2 | | A3X A4 |
|--|---|------------------------|---------------------|--|--|--|----------------------|---|
| Hose Capacityfeet Size of Hose inches Price each | $\begin{array}{r} 50 \\ 1\frac{1}{4}, 1\frac{1}{2} \\ 5.00 \end{array}$ | 50 2 5.00 | 50 2½ 5.00 | 100 114,11/2 6.00 | | $ \begin{array}{c} 100 \\ 2\frac{1}{2} \\ 6.00 \end{array} $ | 150 1½,1½ 7.00 | $\begin{array}{c cccc} & 150 & 150 \\ & 2 & 21/2 \\ & 7.00 & 7.00 \end{array}$ |
| Number | A5 | A5X | A6 | *A3 | *A3X | *A4 | *A5 | *A5X *A6 |
| Hose Capacity feet Size of Hose inches Priceeach | | 200 2 7.50 | 200 21/2 8.00 | $ \begin{array}{r} 50 \\ 1\frac{1}{4}, \frac{1}{2} \\ 7.00 \end{array} $ | $ \begin{array}{r} 50 \\ 2 \\ 7.00 \end{array} $ | $50 \\ 2\frac{1}{2} \\ 7.00$ | 100 1½,1½ 7.50 | $\begin{array}{c cccc} \hline 100 & 106 \\ 2 & 2\frac{1}{2} \\ 7.50 & 8.00 \\ \hline \end{array}$ |

The AO, AOX and AOO can be furnished to hold 75 feet of hose at .50 extra to list *These numbers indicate racks for cotton hose rubber lined. All other numbers are for unlined linen hose.

Racks are furnished japanned red, but can be furnished in gold or aluminum bronze at same price. Shipped with wall brackets unless otherwise specified.

No extra charge for brackets or pipe clamps up to and including 4 inches.

ECLIPSE-Malleable Iron

| Number | 62 | 63 | 64 | 65 | 66 | 67 |
|-----------------------------------|------|------|----------|------------|--------------|------------|
| Hose Capacity, Unlined Linen feet | | | 25 to 75 | 100 to 150 | 100 to 150 l | 100 to 150 |
| Size of Hoseinches | | | | 114,115 | | 214 |
| Price each | 5,00 | 5.00 | 5.00 | 6.00 | 6.00 | 6.00 |

Shipped with wall brackets unless otherwise specified.

No extra charge for pipe clamps up to and including 2½ inches.

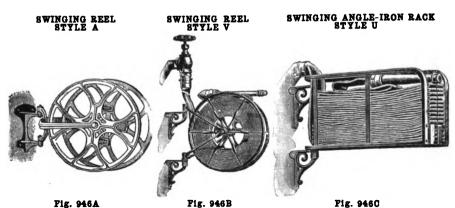
ROYAL-Cold Rolled Steel

| Number | 18 | 19 |
|---|----------|------------|
| Price Japanned, Red, or Bronzed Gold, Aluminum or Copper each | 5.00 | 6,00 |
| " Enameled White " | 6.00 | 7.00 |
| " Nickel or Copper Plated on Iron " | 7.00 | 8.00 |
| " Verde Antique on Iron " | 8.00 | 9.00 |
| " Polished or Nickel Plated on Brass " | 11.00 | 13.00 |
| " Verde Antique on Brass " | 12.00 | 14.00 |
| Capacity, Unlined Linen Hose feet | 25 to 75 | 100 to 150 |

Racks may be attached to wall stand pipe or direct to valve.

In ordering state diameter of hose, and whether with wall plates or pipe clamps. No extra charge for pipe clamps up to and including 2½ inches.

HOSE REELS AND RACKS



SWINGING HOSE REELS, STYLE A

| Size Hoseinches | 11/4-11/2 | 2 | 21/2 | $1^{1}_{4}-1\frac{1}{2}$ | 2 | 21/2 |
|--|-----------|------|------|--------------------------|------|------|
| Capacity Unlined Linen Hosefeet Capacity Rubber Lined Cotton | 175 | 150 | 150 | 250 | 250 | 275 |
| Hose " | 50 | 50 | 50 | 100 | 100 | 100 |
| Priceeach | 6.00 | 6.50 | 7.00 | 7.00 | 8.00 | 8.50 |

SWINGING HOSE REELS, STYLE V

| Size Hoseinches | 114-11/2 | 2 | 21/2 | 11/4-11/2 | 2 | 21/2 | 114-11/2 | 2 |
|---|----------|------------|------------|-------------|-------------|------------|--------------|---|
| Capacity Unlined Linen Hosefeet Priceeach | | 50 6.00 | 50 6.00 | 75 6.00 | 75 6.00 | 75 6.00 | 100 6.00 | 100 6.00 |
| Size Hoseinches | 21/2 | 11/2-2 | 2^{1} | 2 | 2^{1} | 21/2 | 21/2 | |
| Capacity Unlined Linen Hosefeet Priceeach | | | | 200 7.50 | 200 8.00 | | 400 11.50 | • |

No Extra Charge for Pipe Clamps up to and including 4 inches.

ANGLE-IRON HOSE RACKS, STYLE U

| Size Hoseinches | 11/4 or 11/2 | 2 | 21/2 | 11/4 or 11/2 | 2 | 21/2 |
|---|--------------|------|------|--------------|------|------|
| Capacity Unlined Linen Hosefeet Capacity Rubber Lined | 50 | , 50 | 50 | 100 | 100 | 100 |
| Cotton Hose " | 50 | 50 | 50 | 100 | 100 | 100 |
| Price for Unlined Linen Hose each | 5.00 | 5.00 | 5.00 | 6.00 | 6.00 | 6.00 |
| Price for Rubber Lined Cotton Hose " | 7.00 | 7.00 | 7.00 | 7.50 | 7.50 | 8.00 |
| Size Hoseinches | 11/4 or 11/2 | 2 | 21/2 | 11/4 or 11/2 | 2 | 21/2 |
| Capacity Unlined Linen Hosefeet | 150 | 150 | 150 | 200 | 200 | 200 |
| Price for Unlined Linen Hose each | 7.00 | 7.00 | 7.00 | 7.50 | 7.50 | 8.00 |

No Extra Charge for Pipe Clamps up to and including 4 inches. In ordering, state kind of Hose, size and quantity to be placed on Racks.

HOSE REELS AND CARTS

STYLE D WAREHOUSE REEL



Pig. 948A

STYLE F FACTORY AND WAREHOUSE CART

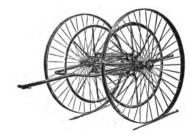


Fig. 948B

| Height | of W | neel | 8 | | • • • • • • | | | | | i | nches | 42 | 48 | 52 |
|---------|---------------|------|---------|-------|-------------|----|-----|------|------|---|--------|-------|-------|-------|
| Capaci | tv11/2- | inch | 4-ply R | ubber | Hose . | | | | | | feet | 250 | 400 | 500 |
| "" | 2 | " | " | 44 | 44 | | | | | | 44 | 200 | 300 | 400 |
| | 21/6 | •6 | 44 | 44 | " | | | | | | " | 150 | 250 | 300 |
| 4 | 11/3 | 4 | Rubber | Lined | Cottor | Ho | se. | | | | . " | 500 | 650 | 800 |
| 4 | \mathbf{z}' | 4 | 44 | и | 44 | " | | | | | " | 350 | 500 | 600 |
| 4 | 21/6 | ш | 44 | " | " | " | | | | | " | 250 | 400 | 500 |
| Price . | -/3 | | | | | | | | | | . each | 35.00 | 45.00 | 55.00 |

FIRE JUMPERS

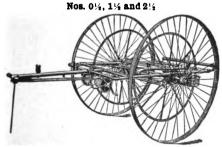


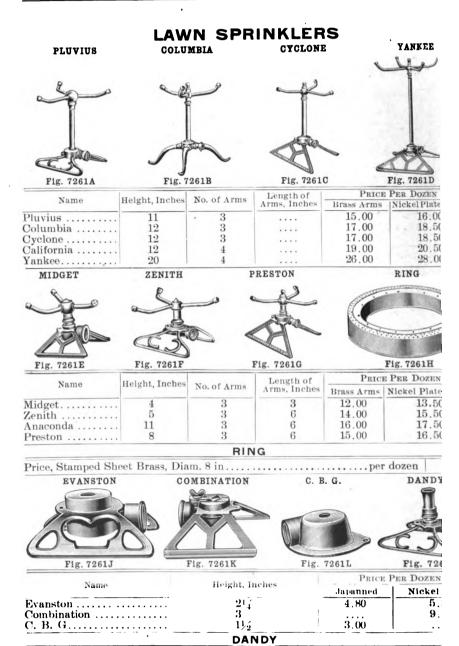
Fig. 948C

| Number | | 1^{1}_{2} | 21/2 |
|------------------|--------------|--|--|
| Height of Wheels | 42 | $\begin{array}{c} 48 \\ 250 \end{array}$ | $\begin{array}{c} 52 \\ 350 \end{array}$ |
| Price | 300 90.00 | 400 100.00 | $500 \\ 110.00$ |

Nos. 01%, 11% and 21% are fitted with Rope Reel and Drag Rope, Nozzle Holder, Fireman's Axe in Spring Holders, Tool Box and Friction Roller at Rear.

For without Rope Reel and Rope, Axe and Axe Holders, deduct 25.00 from list.

Carts can be equipped with Automatic Gongs at following prices: 8-inch, 8.00;
10-inch, 9.25, each net additional,



Price, Polished Brass Top and Black Enameled Iron Base, 51/2 in. High, per doz.

The Dandy Sprinkler has a spray nozzle which can be unscrewed from basttached to ordinary $\frac{1}{2}$ or $\frac{3}{4}$ -inch garden hose,

CHEMICAL FIRE EXTINGUISHERS



PATROL AND ALERT

For General Household and Commercial Use

These machines are the tip-over type and being properly filled ready for service, they are simply grasped by hand, turned over quickly and instantly produce a powerful stream. Can be operated by woman or child. They consist of a brass cylinder built to stand a pressure of 350 pounds, 21% inches high, by 7 inches diameter and have a capacity of three gallons.

A chemically charged stream is forty times as effective as water. The efficiency of one extinguisher is equal to 120 gallons of water. In the head of the extinguisher is a brass cage containing a bottle of sulphuric acid. This bottle is closed by a loose lead stopper which drops from its place when the extinguisher is inverted. The sulphuric acid mixing with the soda solution forms a pressure of carbonic acid gas sufficient to throw a stream of the chemical fifty feet.

Inspected, approved and labeled by the underwriter's laboratories under supervision of National Board of Fire Under-

writers.

| | | | | | | | | |
|--------|--------|----|--------|-----------------|------|------|------|-------|
| Price, | Patrol | or | Alert, | Polished Copper | | | each | 15.00 |
| •• | •• | ** | •• | Nickel Plated | | | | 17.00 |

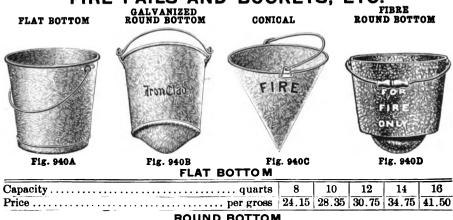


Fig. 2132B

Consists of forty-gallon seamless drawn steel cylinder containing acid receptacle of chemically pure lead protected by copper sheathing heavily tinned, mounted on two wheels of best grade with hub caps and round steel edge tires. Equipped with fifty feet of 34-inch special rubber chemical hose, with brass couplings attached. Brass eccentric shut-off nozzle, wire basket for hose, soda bag, hose spanner, cylinder cap wrench. Measurement over all, height, 49 inches, length 6 feet 4 inches, width, 32 inches, tread 27 inches.

CHAMPION CHEMICAL FIRE ENGINE No. 14 Forty-Gallon

FIRE PAILS AND BUCKETS. ETC.



| MOUND BOILDM | | | | |
|-------------------|-------------|-------|-------|-------|
| Capacity | quarts | 10 | 12 | 14 |
| Price, Plain | . per gross | 33.50 | 35.90 | 39.90 |
| " " Stenciled | . " | 36.20 | 38.60 | 42.60 |
| " Painted Only | . " | | 41.25 | |
| " " and Stenciled | . " | 41.50 | 43.90 | 47.90 |

CONICAL Capacity quarts 12 Price, Plain per gross 48.00 " Stenciled 50.50

| Capacityquarts | |
|-----------------------------------|--------------|
| Price, Flat Bottomper dozen | 7.20 |
| " Round Bottom " " Extra Covers " | 9.00 3.60 |



Fig. 940E

SAFETY FIRE BUCKET TANK

| Number | 1 | 2 |
|--------------------------------------|-------|-------|
| Heightinches | 31 | 34 |
| Diameter | 151/2 | 181/2 |
| Number of Buckets in Tank | 6 | 6 |
| Capacity of Buckets quarts | 10 | 14 |
| " " Tankgallons | 25 | 40 |
| Price, with Buckets and Chemicaleach | | •••• |

An Air-Tight Tank containing a supply of Chemical Solution and six Fire Buckets, with self-raising handles. The Tank and Buckets are made of heavy galvanized iron, lined to prevent rust.

The Tank is Japanned red outside and has hinged cover closing on a rubber packing, making it air-tight and preventing evaporation. The handles of the Buckets are weighted so that when the top bucket is removed the handle of the next raises automatically. Every Tank is accompanied by a bag of dry compound.

RUBBER TUBINGS, ETC.



Fig. 6645A

| | | | 0 | | | | | | | | |
|-------------------------------------|-----|-----|------|-----|------|-----|-----|-----|-----|-----|-----|
| Internal Diameterinches | 1/6 | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1 |
| Price, Plain or Corrugated per foot | .01 | .08 | .12 | .16 | .18 | .20 | .25 | .30 | .35 | .40 | .45 |
| " Cloth Insertion . " | | .10 | .14 | .18 | .20 | .23 | .28 | .33 | .38 | .44 | .50 |

STEAM AND BEER TUBING

| Numb | oer o | of P | ly | | | | | | | | | | 2 | 3 | 4 | 5 | 6 |
|------|-------|------|-------|----|---|------|------|------|------|-------|----|----|-----|-----|-----|-----|-----|
| | | | Steam | | | | | | | | | | .20 | .30 | .40 | .50 | .60 |
| a | 5/6 | 46 | " | u | 0 | | | | | | 16 | | .25 | .35 | .45 | .55 | .65 |
| a | 3/8 | *** | 11 | 66 | | | | | | - | 16 | | .30 | .40 | .50 | .60 | .70 |
| a | 3/8 | u | Beer | " | | | | | | | ee | ١. | | | 28 | .32 | .36 |

STEAM REGULATOR

DIAPHRAGMS

PUMP



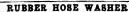


Fig. 6645B Fig. 6645C

| STEAM REGULATOR DIAPHRAGMS | | | | | | | | | | | |
|----------------------------|------|-----|-------|------|--|--|--|--|--|--|--|
| Number | 1 | 2 | 3 | 4 | | | | | | | |
| Outside Diameterinches | 63/4 | 9 | 115/8 | 15 | | | | | | | |
| Priceeach | .55 | .85 | 1.45 | 2.65 | | | | | | | |

PUMP DIAPHRAGMS Edson Loud Number of Pump..... 3 4.00 | 2.00 | 2.00 3.00 3.00

RUBBER VALVE BALL







| Fig. 6645D | RUBBER | VALVE | BALLS |
|------------|--------|-------|-------|

| Fig. 6645D | | RUB | BER 1 | ALVE | BAL | LS | | | | |
|-----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Sizeinches | 1 | 11/8 | 11/4 | 13/8 | 11/2 | 15/8 | 13/4 | 17/8 | 2 | 21/4 |
| Priceper dozen | 1.00 | 1.40 | 1.90 | 2.50 | 3.25 | 4.00 | 4.75 | 5.50 | 6.50 | 8.00 |
| Size inches | 21/2 | 23/4 | 3 | 31/4 | 31/2 | 334 | 4 | 41/2 | 5 | 6 |
| Price per dozen | 10.50 | 13.00 | 15.50 | 19.50 | 23.50 | 29.25 | 35.00 | 54.50 | 70.00 | 115.00 |

Rubber hose washers, 34 inch, per hundred, .75.

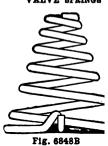
PUMP VALVES AND SPRINGS

RUBBER PUMP VALVES









PUMP VALVES-STOCK LIST

| _ | | | | | | | | | | | | | |
|---------------------------|--------------------------|-------------|------------------|------------------------------------|--|----------------|-----------------------------|-----------------|------------------|--------------------|------------------------------------|-----------------|---|
| Diameterinches | 2 | 2 | 2 | 21/2 | $2\frac{1}{2}$ | $2\frac{1}{2}$ | 3 | 3 | 3 | 3 | 31/4 | 31/4 | 314 |
| Thicknessinches Hole " | $\frac{3}{1}\frac{8}{2}$ | 7/16 1/2 | 1/2 | $\frac{1}{1}$ | 1/2 9/6 | 1/2 5 8 | $\frac{1}{2}$ $\frac{1}{2}$ | 1/2 9/ 16 | 1/2 5 /8 | 9/16 5/8 | $\frac{1}{2}$ $\frac{1}{2}$ | 1/2 5/8 | 5 /8 5 /8 |
| Diameter inches | 33 8 | 3^3 s | 31, | 31/2 | 31/2 | 31.2 | 31/2 | 31/2 | 4 | 4 | 4 | 41/2 | 41/2 |
| Thicknessinches Hole " | 1/2 3/4 | 5/8 5/8 | 1/2 | 1/2 9/16 | $\begin{bmatrix} 1/2 \\ 3/4 \end{bmatrix}$ | 1/2 5/8 | 5 /8 3 /4 | 5 11 × 16 | 5.8 5.8 | 5 /8 11 / 16 | 5/8 3/4 | 5/8 5/8 | 5/8 3/4 |
| Diameter inches | 43/4 | 47/8 | 47/8 | 518 | 51/4 | 53 8 | 51/2 | 51/2 | 51/2 | 534 | 63% | 718 | 8 |
| Thicknessinches Hole " | 3/4 3/4 | 5/8 5/8 | 3/4 13/ 16 | $\frac{\frac{3}{4}}{1\frac{1}{8}}$ | 5/8 7/8 | 5/8 5/8 | 5/8 5/8 | 5/8 3/4 | 3/4 13/ 16 | 5/8 5/8 | $\frac{\frac{3}{4}}{1\frac{1}{4}}$ | $\frac{1}{3/4}$ | $\begin{vmatrix} 1 \\ 1^3 \\ 8 \end{vmatrix}$ |

Rubber Soft Valves are made in four styles, suited for cold water pressur 70 to 100 pounds. Medium Valves, suited for semi-hot water, pressures from 7 pounds. Hard Valves, suited for hot water, pressures 75 to 150 pounds. Price pe 1.00.

VALVE SPRINGS

| | | | | | PR | ICE, EA | .CH | | | |
|--------------------------------|------|------------------|------|------|----------|---------|--------|---------|---------|------|
| Size of Wire Gauge | | | | | For V. | ALVES. | Inches | | | |
| | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 51/2 | 6 |
| 3 | | | | | | | ſ | | | 1.00 |
| 4 | | | | | | | | .60 | .80 | .90 |
| 4 5 6 7 8 9 | | | | i | | .25 | .30 | .40 | .55 | .70 |
| 6 | | | | •••• | .20 | .21 | .24 | .30 | .43 | .50 |
| 7 | | | | .16 | .18 | .19 | .22 | .26 | .35 | .3 |
| 8 | | | .14 | .15 | .17 | .18 | .20 | .22 | .28 | .3 |
| | | .12 | .13 | .14 | .15 | .16 | .19 | .20 | .24 | .2 |
| 10 | | .11 | .12 | .13 | .14 | .15 | .18 | .19 | .20 | .2 |
| 11 | | .10 | .11 | .13 | .13 | .14 | .17 | .18 | .19 | .2 |
| 12 | | .09 | .10 | .11 | .12 | .13 | .16 | .17 | .18 | .2 |
| 13 | | .08 | .09 | .09 | .11 | .12 | .13 | .14 | .15 | |
| 14 | .07 | .07 | .08 | .08 | . 10 | .11 | .12 | .13 | | |
| 15 | .06 | .06 | .07 | .07 | .08 | .09 | .10 | | | |
| 16 | .05 | $.05\frac{1}{2}$ | .06 | .06 | .07 | | | | | |
| 17 | .04 | .05 | .06 | 06 | <u> </u> | | | <u></u> | · · · · | |
| Base Diameter of Spring Inches | 114 | 134 | 21/4 | 2½ | 3 | 3½ | 4 | 41/2 | 5 | 51/1 |

STANDARD BRASS VALVES

WITH BRASS DISC





Fig. 735A

ANGLE



Fig. 735

CROSS



Fig. 7350

GLOBE, ANGLE AND CROSS VALVES-8crewed

| Sizeinches | | | | | | | | | | | |
|---------------------------|-----|------|------|------|-------------------|------|------|--------|-------------------|-------|-------|
| Price, Globe or Angleeach | .72 | .72 | .77 | 1.00 | $\overline{1.26}$ | 1.80 | 2.52 | 3.50 | $\overline{5.30}$ | 10.00 | 14.40 |
| " Cross " | | 1.25 | 1.25 | 1.50 | 2.00 | 2.50 | 3.50 | [5.00] | 8.00 | 16.00 | 24.00 |

GLOBE AND ANGLE VALVES-Flanged

| Sizeinches | | | | | | | | | |
|------------------------|------|------|------|-------|-------|-------|-------|-------|-------|
| Priceeach | 5.00 | 6.75 | 8.50 | 10.50 | 16.00 | 23.00 | 35.00 | 50.00 | 70.00 |
| Diam. of Flangesinches | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 71/2 | 81/2 | 9 |

GLOBE AND ANGLE VALVES-With Wood Wheel

| Sizeinches | 1/4 | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 |
|------------------|------|------|------|------|------|------|------|------|
| Price, Plaineach | | | | | | | | |
| " Finished " | 1.85 | 2.00 | 2.15 | 2.50 | 3.25 | 4.35 | 5.75 | 9.00 |
| " Finished " | 1.85 | 2.00 | 2.15 | 2.50 | | 4.35 | 5.75 | 9 |

GLOBE AND ANGLE VALVES-With Finished Brass Wheel

| Sizeinches | 1/4 | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 |
|-----------------------------------|-----|-----|-----|----|---|------|------|---|
| Price, Finishedeach and Plated. " | | | | | | | | |



P1# 7251

GLOBE AND ANGLE VALVES-Needle Point

| Sizeinches | 14 | 3 8 | 1/2 | 34 |
|---|----------------|------|---------------------|------|
| Size Feed Openinginches Price Globe, Female Openingseach | 1/16 | 1/8 | 3/16 | 14 |
| Price Globe, Female Openingseach | 1.40 | 1.50 | 2.00 | 2.50 |
| Augie | $1.40 \\ 2.00$ | 1.50 | $\frac{2.00}{3.00}$ | 2.50 |
| " with Union " | 2.00 | 2.20 | 3.00 | 3.00 |

STANDARD BRASS CHECK VALVES

HORIZONTAL



Fig. 739A

ANGLE



Fig. 739B

VERTICAL



Fig. 739C

HORIZONTAL, ANGLE, AND VERTICAL CHECK VALVES

Screwed

| Size inches | 1/8 | 1/4 | 3/8 | 1/2 | 3⁄4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|---------------------|----------|-----|-----|------|------|------|------|------|------|-------|-------|
| Horizontaleach | .65 | .65 | .70 | .90 | 1.15 | 1.60 | 2.25 | 3.15 | 4.75 | 9.00 | 13.00 |
| Angle or Vertical " | <i>.</i> | .72 | .77 | 1.00 | 1.26 | 1.80 | 2.52 | 3.50 | 5.30 | 10.00 | 14.40 |

HORIZONTAL CHECK VALVES

Flanged

| Sizeinches | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|--|--------------|-----------|--------------|------------------------|------------|------------|---------------|---------------|------------|
| Priceeach Diameter of Flangesinches | 4.90 31/3 | 6.50 4 | 8.25 41/6 | ${\overset{10.15}{5}}$ | 15.50 6 | 22.00 7 | 33.50 71/2 | 47.50 81.6 | 66.50 9 |

HORIZONTAL With Drip Cock



Fig. 739D

BALL



Fig. 739E

SWING.



Fig. 739F

HORIZONTAL, BALL AND SWING CHECK VALVES

Screwed

| Sizeinches | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|---|------|------|------|------|--------------|------|------|-------|-------|
| Price, with Drip Cock each "without Drip Cock " Ball Check" | | 1.85 | 2.20 | 2.70 | 3.60 | | | | |
| " Swing Check " | 2.15 | 2.25 | 2.75 | 3.50 | 4.00 4.25 | 5.50 | 7.50 | 15.00 | 22.00 |

JENKINS BROS.' BRASS VALVES

GLOBE



Fig. 3416A

ANGLE



Fig. 34161



Fig. 3416C

SCREWED

| Sizeinches | | | | | | | | | | | |
|---------------------|------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|-----------------------|
| Globe and Angleeach | 1.10 | 1.10 1.70 | 1.25 2.00 | 1.60 2.25 | 2.20 2.50 | 2.80 3.25 | 4.00 4.75 | 5.50 6.25 | 8.75 9.50 | 15.75 20.00 | $\frac{22.00}{27.50}$ |

FLANGED

| Sizeinches | | | | | | | | | 21/2 | |
|------------------------|------|------|------|----------------|------|-------|-------|-------|-------|-------|
| Globe and Angleeach | 3.50 | 4.00 | 4.00 | 5.00 | 6.00 | 9.00 | 11.00 | 16.50 | 25.00 | 34.00 |
| Cross" | | | 7.00 | 8.00 | 9.00 | 12.00 | 15.00 | 23.00 | 33.00 | 44.00 |
| Diam. of Flangesinches | 23/4 | 3 | 3 | $3\frac{1}{2}$ | 4 | 41/2 | 5 | 6 | 7 | 71/2 |

EXTRA HEAVY SCREWED

| Sizeinches | 14 | 3 8 | 1,2 | 34 | 1 | 11/4 | 11/2 | 2 | 2½ | 3 |
|------------|------|------|------|------|------|------|-------|-------|-------|-------|
| Priceeach | 3.00 | 3.50 | 4.C0 | 5.00 | 6.50 | 8.25 | 11.00 | 16.00 | 33.00 | 45.00 |

EXTRA HEAVY FLANGED

| Sizeinches | | | | | | | | |
|-------------------------------------|--------------|-------------|-------|-------|--------------|-------|--------------|-------|
| Priceeach Diameter of Flangesinches | 6.00 31/4 | 7.50 33/ | 10.00 | 13.00 | 17.00 516 | 24.00 | 43.00 714 | 57.00 |

JENKINS DISCS

NEW STYLE



Fig. 3416D

OLD STYLE



Fig. 3416E

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 1!4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 |
|------------|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| Priceeach | .03 | .04 | .04 | .05 | .06 | .09 | .12 | .18 | .24 | .40 | .50 | .60 | .70 |
| Sizeinches | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| Price each | .80 | 1.00 | 1.20 | 1.40 | 1.80 | 2.25 | 2.50 | 3.50 | 4.00 | 5.00 | 6.00 | 7.50 | 9.00 |

BRASS CHECK VALVES

JENKINS BROS.

HORIZONTAL



Fig. 742A

ANGLE



VERTICAL



SCREWED

| Size .inches | 1/8 | 1/4 | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|--------------|------|------|------|------|------|------|------|------|------|-------|-------|
| Priceeach | 1.10 | 1.10 | 1.20 | 1.30 | 1.90 | 2.60 | 3.60 | 5.00 | 7.50 | 13.50 | 21.00 |

FLANGED

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|------------|------|------|------|------|-------|-------|-------|-------|
| Price each | 4.00 | 5.00 | 6.00 | 8.00 | 10.00 | 15.00 | 23.00 | 32.00 |

SWING CHECK VALVES

JENKINS BROS.



Fig. 742D

P. & C.



Fig. 742E

JENKINS BROS-SCREWED

| Sizeinches | 3 % | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 |
|------------|------|------|------|------|------|------|------|-------|-------|
| Priceeach | 1.20 | 1.30 | 1.90 | 2.60 | 3.60 | 5.00 | 7.50 | 14.00 | 21.00 |

JENKINS BROS-FLANGED

| Sizeinches | 1 | 114 | 11/2 | 2 | $2\frac{1}{2}$ | 3 |
|------------|------|------|-------|-------|----------------|-------|
| Priceeach | 6.00 | 8.00 | 10.00 | 15.00 | 23.00 | 33.00 |

P. & C-SCREWED

| Sizeinches | | 3,8 | | | | | 11/2 | | | 3 |
|------------|------|------|------|------|------|------|------|------|-------|-------|
| Price each | 1.25 | 1.30 | 1.50 | 1.75 | 2.25 | 3.25 | 4.25 | 6.25 | 12.00 | 20.00 |

P. & C-FLANGED

| Sizeinches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|------------|------|------|-------|-------|-------|-------|
| Priceeach | 6.25 | 7.85 | 10.25 | 15.50 | 25.00 | 32.50 |



LUNKENHEIMER REGRINDING BRASS VALVES







Fig. 6956A

Fig. 6956B

Fig. 6956C

The large sale of Lunkenheimer regrinding valves has demonstrated that steam users appreciate the fact that it is possible to secure in them a reliable valve, which can be repaired without disconnecting pipes or incurring any expense other than the slight labor involved in regrinding the seating surfaces. When a steam user installs Lunkenheimer valves the expense ends with the purchase of the articles. This is not true with valves in which to secure a new seat bearing it is necessary to purchase extra parts; therefore, as a matter of economy, the first cost of Lunkenheimer valves should not be the principal consideration.

The expense of disconnecting pipes and taking out defective valves is many times more than the cost of a good article, which, if installed in the first place, would render such expense unnecessary. Therefore, when installing pipe systems, it will be found

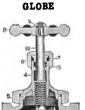
better to purchase Lunkenheimer valves rather than the common grades.

Many forms of valves have been placed upon the market, some of which have rubber, asbestos or copper discs, and while for ordinary pressures (say up to sixty or eighty pounds) such valves give fair satisfaction, yet when the pressures are above that, they lack durability. Aside from this fact, in order to renew the seat bearings in such valves it is necessary to go to the expense of purchasing extra discs, the sale of which is controlled by the manufacturer of the valves. Valves will not give satisfaction when any part of the seat bearing is composed of metal whose melting point is below, or very near, the temperature of steam at one hundred pounds pressure. Copper disc valves will, in the course of time, prove unsatisfactory, for the reason that the copper disc, when subjected to heat for any period, undergoes a physical change and deteriorates very rapidly.

| very rapidly. | iny po | iiou, i | under | goca | a pr | iybica | i cha | | ia acto | ioians | | | |
|--|--|---------|--|--------------|---------------|--|------------------|---------------------|--|----------------------|--|--|--|
| | ME | DIUN | <u> 1-sc</u> | RE | WED | | | | | | | | |
| Sizeinches 1/8 | 4 3/8 | 1 1 2 | 3 | 4 | 1 | 11/4 | 11% | 2 | 21/2 | 3 | | | |
| Globe and Angle, each .70 Cross | | | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | .70 | | 3.90 5.10 | $\frac{6.20}{8.00}$ | | $16.50 \\ 24.00$ | | | |
| MEDIUM-FLANGED | | | | | | | | | | | | | |
| Size inches $\frac{3}{8}$ $\frac{1}{2}$ $\frac{3}{4}$ $\frac{1}{1}$ $\frac{11}{4}$ $\frac{11}{2}$ $\frac{2}{2}$ $\frac{21}{2}$ $\frac{3}{4}$ | | | | | | | | | | | | | |
| Price, Globe and Angleeac "Cross" | | 3.40 | | 0 5. 0 8. | | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | $11.00 \\ 15.00$ | | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | | |
| | EXTR | A HE | AVY | -sc | REW | /ED | | | | | | | |
| Sizeinches 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 116 | 2 | 212 | 3 3 | 4 | | | |
| Price, Globe and Angleeach | | | | | | | | | | 30 53.90 40 63.60 | | | |
| | EXTR | A HE | AVY | -FL | ANG | ED | | | | | | | |
| Sizeincher | 3 3/8 | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 31 | 4 | | | |
| Price, Globe and Angle, each | | | 5.80 | | | | | | | 00 74.0 0 | | | |
| " Cross" Diameter of Flangesinche | $\begin{vmatrix} 3.50 \\ 2\frac{1}{2} \end{vmatrix}$ | | $\frac{8.20}{3\frac{1}{2}}$ | 10.50 4 | 14.50 41/2 | 19.00 5 | 27.00 6 | 43.00 5 7 | $71.00\ 77.$ | 00 94.00 2 9 | | | |

LUNKENHEIMER "RENEWO" BRASS VALVES

Suitable for Working Pressures up to 200 Pounds







CROSS

Fig. 5844A

Fig. 5844B

Fig. 5844C

For the benefit of the trade preferring a renewable seat regrinding valve rather than the regrinding type, the above valve has been designed.

This valve differs from the regrinding valve, only in the construction of the disc and seat. The disc, 12, is provided with a projecting ring, which enters the valve seat ring, 13. Its principal function is the preservation of the seat, which is accomplished in a two-fold manner. First, as it enters the seat, it deflects the current of steam from the seat ring face, thus preventing the wire drawing which would otherwise occur. This feature is especially important should the valve be left partly open for any length of time. Secondly, the seating surface is kept free from scale and grit by the action of the thin current of steam discharged over it as the disc is brought home.

Another function of this extension ring is the prevention of water hammer, which is caused by the sudden admission of steam, for it will readily be seen that no matter how quickly the hand wheel may be operated, the flange will only permit the steam to enter gradually.

| | sc | SCHEWED | | | | | | | | | | | |
|---|--|--|---|----------------------|-------------------|---|----------------------|----------------------|-----------------------|-------------------|--|--|--|
| Sizeinches | 14 | 3/8 | 1/2 | 34 | 1 | 114 | 1½ | 2 | 212 | 3 | | | |
| Price, Globe or Angle Valves .each "Cross Valves" | 1.70 | 2.00 | 1.60 2.25 | 2.20 2.50 | 2.80 3.25 | 4.00 4.75 | 6.25 | 9.50 | 20.00 | 27.50 | | | |
| Face to Face Globe Valveinches Center to Face Angle " " " " Cross " " | $egin{pmatrix} 2\frac{1}{8} \\ 1 \\ 1 \end{bmatrix}$ | $egin{array}{c} 2larls_{16}^{1/4} \ 1rac{1}{16} \end{array}$ | 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 31/4 11/5 11/6 | 314 114 114 | 1 1 1 2 1 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 | 4% 23 23 23 | 53/4 25/8 25/8 | 613 35 35 35 | 7:4 313 313 | | | |

FLANGED 114 11/3 Price, Globe or Angle Valves.....each 4.00 4.00 5.00 6.00 9.00 11.00 16.50 25.00 34.00 12.00 15.00 23.00 33.00 44.00 6.50 7.00 8.00 9.00 Cross Valves 37 8 216 216 216 31/2 414 $\frac{3\frac{1}{2}}{2}$ 714 Face to Face Globe Valve.....inches 3 4 18 51/2 81/2 9 15%213 213 3 16 3 16 5 378 214 214 4 18 4 18 Center to Face Angle 15 $\frac{5}{2}$ Cross $\overline{2}_{1}_{2}$ 44 Diameter Flanges 4 6 " Thickness

| SCREWED AND FLANGED_ | | | | | | | | | | | | |
|--|------|------|------|------|------|------|-------|----------------|--------------|--|--|--|
| Sizeinches | 3/8 | 1, | 34 | 1 | 114 | 11/2 | 2 | 2^{1}_{2} | 3 | | | |
| Price, Flanged Inlet and Screwed Outlet or Screwed Inlet and Flanged Outlet Globe Valveseach | | | | | | | | | | | | |
| Price, Flanged Inlet and Screwed Outlet or Screwed Inlet and Flanged Outlet Angle Valves | 2.75 | 3.10 | 3.75 | 4,50 | 7.50 | 8.25 | 13.00 | 21. 0 0 | 28.06 | | | |

LUNKENHEIMER REGRINDING BRASS CHECK VALVES

HORIZONTAL



Fig. 740A

ANGLE



Fig. 740B

VERTICAL.



Fig. 740C

HORIZONTAL, ANGLE, AND VERTICAL CHECK VALVES - Screwed

| Sizeinches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|--|-----|-----|------|------|------|------|------|------|-------|-------|-------|
| Rougheach | .50 | .50 | .60 | .85 | 1.15 | 1.55 | 2.30 | 3.25 | 5.20 | 10.00 | 14.00 |
| Finished " | .75 | .75 | .90 | 1.30 | 1.75 | 2.40 | 3.50 | 5.00 | 7.80 | 12.50 | 17.50 |
| With Drain Cock " | | | 1.05 | 1.30 | 1.60 | 2.00 | 2.75 | 3.70 | 5.65 | 10.50 | 14.50 |
| With Enlarged Seat and Drain Cock " | | | | 1.60 | 2.00 | 2.75 | 3.70 | 5.65 | 10.50 | | |
| Horizontal, with En- larged Seat " | | | | 1.15 | 1.55 | 2.30 | 3.25 | 5.20 | 10.00 | | |

HORIZONTAL, ANGLE, AND VERTICAL CHECK VALVES-Flanged

| Sizeinches 3/8 | 1/2 3/4 | 1 11/4 | 11/2 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------|-----------|--------|--------|------|---|------|---|
| Price each 1.90 | | | | | | | |

SECTIONAL



Fig. 740D





Fig. 740E





Fig. 740F

SWING CHECK VALVES-Screwed

| Size | inches | 14 | 3/8 1/2 | $^{3}4 + 1$ | $1\frac{1}{2}$ 4 | 11/2 | 2 | $2\frac{1}{2}$ | 3 |
|-------|--------|----|---------|-------------|------------------|------|---|----------------|---|
| Price | | | | | | | | | |

SWING CHECK VALVES Screwed and Flanged, and Flanged

| Size inches | 3/8 1/2 | 34 | 1 114 | 11/2 | 2 | $2\frac{1}{2}$ | 3 |
|--------------------------|-----------------|-----------|---------|------|------|----------------|-------|
| Screwed and Flanged each | $2.00 \ \ 2.20$ | 2.80 - 3. | 80 5.50 | 7.00 | 9.70 | 15.50 | 22.20 |
| | 2.60 2.90 | | | | | | |

BALL CHECK VALVES Horizontal, Angle, or Vertical

| Sizeinches 14 | 1/4 | 3/8 1/2 | 3/4 | 1 | 114 | 11/2 | 2 | 21/2 | 3 |
|---------------|-----|---|--|--------------|--------------|--------------|--------------|----------------|------------------|
| Priceeach | .95 | $\begin{array}{ccc} 1.10 & 1.6 \\ 1.50 & 2.0 \end{array}$ | $\begin{vmatrix} 2.30 \\ 2.70 \end{vmatrix}$ | 3.10 3.50 | 4.00 4.40 | 6.20 6.60 | 9.40 9.80 | 18.00 18.50 | $25.00 \\ 25.50$ |

The valves listed above are for a working pressure up to 200 pounds.

"CLEAN SEAT" GLOBE AND ANGLE VALVES

For Pressures Up to 3000 Pounds **BRASS SCREW ENDS**





Fig. 9082A

GLORE SECTIONAL



Fig. 9082B



Fig. 9082C

MEDIUM For 200 Pounds Pressure

| Sizeinches | 1/8 | 1/4 | 3/8 | 12 | 3/4 | 1 | 114 | 115 | 2 | 212 | 3 |
|------------|------|------|-------------------|------|-------------------|------|------|------|------|-------|-------|
| Priceeach | 1.10 | 1.10 | $\overline{1.25}$ | 1.60 | $\overline{2.20}$ | 2.80 | 4.00 | 5.50 | 8.75 | 15.75 | 22.00 |

EXTRA HEAVY For 500 Pounds Pressure

| | | | | | . — | | | | | |
|-------|--------------|---------|------|-------------|-------|------|-------|-------|-------|-------|
| L1: | inches 1/ | 1 3 / 1 | 1/ | 3/ | 1 1 . | 11/ | 111/ | ່ຄ | 01/ | 9 |
| Size | . inches 4 | 1 1 9 R | 2.9 | 9/4 | | 1.54 | 1 1% | 2 | Z 50 | J |
| | | | | | | | | | | |
| Dates | each 3.00 | . 2 50 | 4 00 | 5 M | C 50 | 0 05 | 11 00 | 10 00 | 20 00 | 45 00 |
| Price | each 5.00 | 0.00 | 4.00 | 0.00 | 0.00 | 0.20 | 11.00 | 10.00 | 55.00 | 40.00 |

HYDRAULIC For 3000 Pounds Pressure

| Sizei | nches 1/4 | 38 12 | 34 1 | 11/4 | $ 1\frac{1}{2} 2$ | 21/2 3 |
|-------|-------------|----------|-----------|----------|-------------------|---------------|
| Price | each 5.00 | 5.006.00 | 7.50 10.0 | 00 12.50 | 16.50 24.0 | 0 50.00 65.00 |



Fig. 9082D

In the ordinary type of valve the prime cause of leakage and cutting is the lodgment of sediment, scale and other foreign matter on the seat or disc as the valve is closed. Such deposits prevent tight closing and allows leakage which, however slight at first, leads to cutting and destruction of the disc and seat.

Regrinding valves and renewable disc valves are examples of attempts to cure the difficulty by "treating the symptoms" or effacing the results, the restoration process having to be performed repeatedly. The "Clean Seat" principle removes the cause and prevents the occurrence of the difficulty, keeping the valve in good condition, not

by frequent renewal of parts, but by proper protection of the original surfaces. In this way the valve is tight always, not just after receiving a new disc or being reground.

The general construction is of maximum strength and durability. One feature which is particularly attractive to the user, and which adds materially to the life of the valve, is the construction of the bonnet joint. The bonnet itself is strong, and enters the valve body with a long thread. The V joint between bonnet and body insures a strong and steam-tight joint, and prevents spreading of either body or bonnet.

The "Clean Seat" principle reduces the wear on seats and discs to a positive minimum, and makes easy the ordinarily difficult work of controlling high pressures.

For long, hard, and continuous service, the "Clean Seat" Valve has no rival. On this claim we stand ready to submit conclusive proof beyond even a reasonable doubt.

UNION BONNET

GLOBE VALVES

REGRINDING

GLAND



For Steam Working Pressures Sizes 14 inch and smaller, up to 225 pounds Sizes 14 to 3 inch, inclusive, up to 200 pounds Sizes 314 and 4 inch, up to 175 pounds Tested to 250 pounds hydraulic pressure per square inch

SECTIONAL

Fig. 4790A

For marine service a valve which can be reground while in place is almost indispensable, and valves of this type are universally used in the navy. This style valve, however, offers just as many advantages to all steam users, as, apart from the regrinding feature, it is the strongest form which can be adopted. The body is reinforced by a heavy union ring, and when pressure is applied, any tendency of the body to stretch is counteracted by this ring, and the contact between the body and ring becomes more intimate as the pressure increases. SCREWER

| _ | | | | | |
|------|------|-----|------|----|---|
| ahaa | 1 1, | 3.4 | 1 1/ | 3/ | 1 |

| Sizeinches | 1/4 | 3/8 | 1,2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/6 | 4 |
|----------------------------|------|------|------|------|------|------|------|-------|-------|--------------------|-------|--------------|
| Price, Globe or Angle each | 1.30 | 1.50 | 1.90 | 2.50 | 3.50 | 5.00 | 7.00 | 11.00 | 20.00 | $\overline{29.00}$ | 45.00 | 65.00 |
| " Cross " | | | 2.65 | 3.50 | 4.75 | 6.00 | 9.00 | 14.00 | 28.00 | 42.00 | | |

FLANGED

| Sizeinches | | | | 11/2 | | 21/2 | 3 | 31/2 | 4 |
|------------------------------------|------|-------|-------|-----------|-------|-----------|-------|-----------------|-------|
| Price, Globe or Angle each | 6.00 | 8.00 | 11.00 | 14.00 | 20.00 | 33.00 | 48.00 | 65.00 | 90.00 |
| " Cross " | 9.25 | 12.25 | 17.00 | 23.00 | 33.00 | 48.00 | 72.00 | ١ | |
| Diameter of Flangesinches | 31/2 | 4 | 41/2 | 5 55/6 | 6 | 7 | 71/2 | 81/6 | 9 |
| Face to Face, Globe " | 31/6 | 43/6 | 4% | 55% | 6 | 7 63/4 | 71% | 878 | 95% |
| Center to Inlet or Outlet, Angle " | 21/4 | 21/2 | 27% | 33% | 33/4 | 45% | 45% | 51/4 | 51% |
| Face to Face, Cross " | 412 | 5 | 534 | 63% | 71/2 | 85% | 914 | $10\frac{7}{2}$ | l íf |

HORIZONTAL CHECK









Fig. 4790D inches 1/4 3/8 1/6 3/4 1 11/4 11/6 9.

| | | | | | | | 1/2 | | | |
|---|------|------|------|------|------|-------|-------|-------|-------|-------|
| Priceeach | 1.15 | 1.35 | 1.70 | 2.25 | 3.15 | 4.50 | 6.30 | 9.90 | 18.00 | 26.00 |
| | FL | ANG | ED | | | | | | | |
| Size | | in | ches | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
| Price each Diameter of Flanges inches Face to Face, Horizontal " Center to Inlet or Outlet, Angle " | | | | | 7.00 | 10.00 | 12.00 | 19.00 | 20.00 | 19.00 |

In ordering always be sure to state whether horizontal or angle.

BRASS HOSE VALVES

STANDARD PATTERN



Fig. 7576A

GARDEN HOSE VALVES

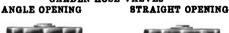








Fig. 7576C

STANDARD PATTERN

Iron Handle, Loose Swivel and Leather Disc

| Size inches | 1 | 11/4 | 11/2 | 2 | 21/2 |
|--|------|------|------|------|------|
| Price, Rough Bodyeach | 3.15 | 3.70 | 4.75 | 7.00 | 8.50 |
| Price, Rough Bodyeach " " Nickel Plated" | 3.65 | 4.30 | 5.50 | 8.00 | 9.75 |

STANDARD PATTERN

Finished Brass Wheel, Loose Swivel and Leather Disc

| Size | inches | 11/6 | 2 | 21/6 |
|-----------------|---------------------|------|--------|-------|
| | | _! | 1 | |
| Price. Finished | each | 9.00 | 111.50 | 14.50 |
| | and Nickel Plated " | | | 16.00 |

GARDEN HOSE VALVES

Angle Opening

| Sizeinches | 12 34 | 1 | 11/4 | 11/2 | 2 | 2^{1} |
|------------|----------------|----------|------|------|------|---------|
| Priceeach | 1.65 ± 1.6 | 5 2.20 | 3.40 | 4.75 | 7.00 | 15.00 |

GARDEN HOSE VALVES

Straight Opening

| Size | . inches | 1.5 | 34 | 1 | 114 | 112 | 2 | 214 |
|-------|----------|------|------|------|------|------|------|-------|
| Price | each | 1.65 | 1.65 | 2.20 | 3.40 | 4.75 | 7.00 | 15.00 |

These valves will be furnished with any standard thread required.



BRASS VALVES





LUNKENHEIMER



Fig. 8773A

Fig. 8773B

| 87 | ГΔ | N | D | Δ | D | |
|----|----|---|---|---|---|---|
| - | - | | _ | m | п | _ |

| Sizeinches | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | | | |
|------------|------|------|------|------|-------|-------|-------|--|--|--|
| Priceeach | 3.10 | 4.40 | 5.65 | 6.75 | 10.00 | 13.75 | 21.00 | | | |

LUNKENHEIMER

| Sizeinches | 3/4 | 1 | 114 | 1½ | 2 | $2\frac{1}{2}$ | 3 |
|------------|------|------|------|------|-------|----------------|-------|
| Priceeach | 3.10 | 4.40 | 5.65 | 6.75 | 10.00 | 13.75 | 21.00 |

THROTTLE

LUNKENHEIMER
"HANDY" LEVER GATE LE

LEVER THROTTLE

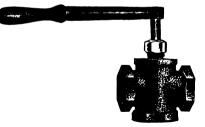






Fig. 8773D



Fig. 8773E

THROTTLE

| Sizeinches | 3⁄4 | 1 | 1/4 | 11/2 | 2 | $2\frac{1}{2}$ |
|------------|-------|-------|-------|-------|-------|----------------|
| Priceeach | 10.00 | 11.50 | 14.00 | 20.00 | 25.00 | 35.00 |

LUNKENHEIMER "HANDY" LEVER GATE For Pressures not to Exceed 75 Pounds

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|------------|------|------|------|------|------|------|-------|-------|-------|-------|
| Priceeach | 1.60 | 1.80 | 2.50 | 3.50 | 5.00 | 7.50 | 13.50 | 19.00 | 40.00 | 60.00 |

LUNKENHEIMER LEVER THROTTLE For Working Pressures up to 175 Pounds

| Size inches | 3/4 | 1 | 14 | 11/2 | 2 | 21/2 |
|-------------|------|------|------|------|-------|-------|
| Priceeach | 3.00 | 4.00 | 5.00 | 7.00 | 10.00 | 19.00 |

BRASS GATE VALVES

STANDARD







Fig. 4836B



Fig. 4836C

STANDARD, SCREWED

| Sizeinches | 1/4 | 8/8 | 1/2 | 8/4 | 1 | 11/4 | 11/2 |
|------------|------|-------|-------|-------|-------|-------|--------|
| Priceeach | 1.25 | _1.25 | 1.30 | 1.75 | 2.50 | 3.50 | 5.00 |
| Sizeinches | | | | | | | *6 |
| Priceeach | 7.50 | 14.00 | 20.00 | 32.00 | 50.00 | 70.00 | 120.00 |

STANDARD, FLANGED

| Sizeinches | 2 | 21/2 | 3 | *31/2 | *4 | *5 | *6 |
|---------------------------|------|-------|-------|-------|-------|-------|--------|
| Priceeach | | 24.00 | 34.00 | 45.00 | 60.00 | 85.00 | 135.00 |
| Diameter of Flangesinches | 6 | 7 | 71/2 | 81/2 | 9 | 10 | 11 |
| Face to Face " | 51/6 | 6 | 615/6 | 61/4 | 7 | 91/4 | 103/4 |

QUICK OPENING, SCREWED

| Sizeinches | 3/4 | 1 | 11/4 | 1½ | 2 | 21/2 | 3 |
|------------|------|------|------|------|-------|-------|-------|
| Priceeach | 3.25 | 4.50 | 6.00 | 8.00 | 12.00 | 22.00 | 30.00 |

QUICK OPENING, FLANGED

| Size | inches | 2 | 21/2 | 3 |
|-------|--------|-------|-------|-------|
| Price | each | 18.50 | 32.00 | 45.00 |

HOSE WITH IRON WHEEL

| Sizeinches | 1 | 11/4 | 11/2 | 2 | 21/2 | _ 3 |
|---|------|------|------|------|-------|-------|
| Price, Rough Body, without Cap and Chain.each | 2.50 | 3.50 | 5.00 | 7.50 | 14.00 | 20.00 |
| " " with Cap and Chain " | 3.75 | 4.85 | 6.50 | 9.25 | 16.50 | 23.50 |

HOSE WITH FINISHED BRASS WHEEL

| Sizeinches | | | | | | |
|--|------|------|-------|-------|-------|-------|
| Price, Finished, without Cap or Chain each | 5.50 | 7.25 | 8.75 | 13.25 | 22.00 | 30.00 |
| " " with Cap and Chain " | 6.75 | 8.60 | 10.25 | 15.00 | 24.50 | 33.50 |
| Price, Finished and Nickel Plated, | | ĺ | | l | | ł |
| without Cap or Chain " | 5.90 | 7.70 | 9.25 | 14.00 | 23.00 | 31.50 |
| Price, Finished and Nickel Plated, | | | | l | ł | 1 |
| with Cap and Chain " | 7.35 | 9.35 | 11.00 | 16.00 | 26.00 | 35.50 |

^{*}Note-3½ to 6-inch valves have flanged bonnet, non-rising stems and are made on order only.

Hose valves have standard iron pipe thread on female end and hose thread on male end. When ordering, send sample hose thread.

BRASS GATE VALVES

JENKINS



Fig. 4792A

PRATT AND CADY



Fig. 4792B

JENKINS

| Size inches | 3/8 | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 |
|---------------------|------|------|------|------|------|-------|-------|-------|-------|
| Price, Screwed each | 1.90 | 2.00 | 2.50 | 3.25 | 4.25 | 5.25 | 7.50 | 14.00 | 20.00 |
| " Flanged " | | 3.50 | 4.50 | 6.00 | 7.50 | 10.00 | 14.00 | 21.00 | 28.00 |

PRATT AND CADY

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|----------------------------|------|------|--------------|--------------|--------------|--------------|--------------|---------------|
| Price, Screwedeach Flanged | 1.50 | 1.50 | 1.65 4.65 | 2.20 5.65 | 2.80 7.50 | 4.00 9.35 | 5.30 14.00 | 7.80 16.00 |

LUNKENHEIMER



Fig. 4792C

SCOTT



Fig. 4792]

LUNKENHEIMER

| Sizeinches | 1/4 | 3.8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | $2\frac{1}{2}$ | 3 |
|---|------|------------------------|------------------------|----------------------|----------------------|----------------------|-----------------------|------------------------|---------------------------|---------------------------|
| Price, Screwedeach " " and Flanged " " Flanged" | 1.10 | $1.10 \\ 2.00 \\ 2.60$ | $1.30 \\ 2.40 \\ 3.00$ | 1.90 3.10 4.00 | 2.50 4.20 5.30 | 3.50 5.90 7.70 | 5.00 8.20 10.50 | 7.50 11.20 14.00 | $14.00 \\ 18.00 \\ 21.00$ | $20.00 \\ 27.00 \\ 32.00$ |

SCOTT

| Sizeinches | | | | | | | | |
|----------------------------|------|------|------|------|-------|-------|-------|-------|
| Price, Screwedeach Flanged | 1.30 | 1.75 | 2.50 | 3.50 | 5.00 | 7.50 | 14.00 | 20.00 |
| " Flanged " | | | | 9.00 | 12.00 | 14.00 | 24.00 | 34.00 |

STANDARD IRON BODY VALVES

WITH BRASS DISC BRASS MOUNTED

GLOBE



Fig. 749A



Fig. 749B

| Size | inches | 2 | 21/2 | 3 |
|---|--------|--------------|--------------|---------------|
| Price, Globe or Angle, Screwed " " " Flanged | . each | 5.40 7.00 | 7.35 9.00 | 9.80 12.50 |
| " " " Flanged " Cross Valves, Screwed " " Flanged | . " | 6.50 | 9.00 | 12.50 |

GLOBE

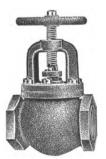


Fig. 749C

WITH YOKE





Fig. 749D

CROSS



Fig. 749E

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2. | 5 | 6 |
|--|----------------|------------|----|------|----|-------|----|----------------|
| Price, Globe or Angle, Screwed.each | 7.00 | 9.00 | | | | | | 37.50 |
| " " " " Flanged. " " Cross Valves, Screwed " | 8.60 | 10.75 | | | | | | 42.00 47.25 |
| " " Flanged " | | l <u>.</u> | | | | | | 54.00 |
| Sizeinches | 7 | 8 | 10 | 12 | 14 | 15 | 16 | |
| Price, Globe or Angle, Screwed.each | | | | | | | | |
| " " " " Flanged. " " Cross Valves, Screwed " | 68.00 78.00 | | | | | | | |
| " " Flanged "_ | | | | | | | | |

STANDARD IRON BODY CHECK VALVES

HORIZONTAL



VERTICAL





Fig. 761A

Size inches



Pig. 761B

41/2

| | יטח | TIZUN | HAL | | | | | |
|------------|------|-------|------|-------|-------|-------|-------|-------|
| Sizeinches | | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
| Priceeach | 3.60 | 6.50 | 8.90 | 12.25 | 14.25 | 19.00 | 22.00 | 30.00 |
| | VE | ERTIC | AL | | | | | |

21/2

31/2

3

Priceeach 9.50 12.50 17.00 21.00 30.00 33.00 40.00 SWING

| Size, inches | 246 | 1 3 | 316 | 4 | 41/6 | 5 | 16 | 7 | 8 | 10 | 12 |
|--------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| | | | | | | | | | | | |
| Price, each | 15 00 | 18 00 | 24 00 | 27 00 | 33 00 | 38 00 | 48 00 | 62 00 | 75 00 | 125 00 | 200 00 |

HORIZONTAL

FLANGED

VERTICAL







Fig. 761D

| Sizeinches | | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 14 | 15 |
|-----------------------------|-------|-------|-------|-------|-----------------|-------|--------|--------|--------|-----------|
| Priceeach | 11.50 | 18.00 | 26.00 | 35.00 | 50.00 | 62.00 | 115.00 | 175.00 | 300.00 | |
| Diameter of Flanges, inches | 71/2 | 9 | 10 | 11 | $12\frac{1}{2}$ | 131/2 | 16 | 19 | 21 | 221_{4} |

HORIZONTAL

VERTICAL

| Sizeinches | 6 | 7 | 8 | 10 |
|---------------------------------------|-------|-------|-------|--------|
| Price each | 45.00 | 67.00 | 78.00 | 135.00 |
| Price each Diameter of Flanges inches | 11 | 121/2 | 131/2 | 16 |

| SWIN |
|------|
|------|

| Sizeinches | | 3 | 31/2 | 4 | 412 | 5 | 6 | 7 | 8 |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|---------|---------|
| Priceeach | 17.00 | 21.00 | 27.00 | 30.00 | 36.00 | 42.00 | 52.00 | 67.00 | 80.00 |
| Diameter of Flanges inches | 7 | 71/2 | 81/2 | 9 | 914_ | 10 | _11 | 121/2 | 131/2 |
| Sizeinches | 10 | 12 | 14 | 15 | 16 | 18 | 20 | 24 | 30 |
| Priceeach | 135.00 | 220.00 | 350.00 | 425.00 | 475.00 | 700.00 | 850.00 | 1200.00 | 2000.00 |
| Diameter of Plances inches | 16 | 19 | 21 | 221/4 | 231/2 | 25 | 271/6 | 32 | 383/4 |

JENKINS BROS.' IRON BODY VALVES

GLOBE SCREWED







ANGLE PLANGED



Fig. 4833A

Fig. 4833B

Fig. 4833C

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|---|------|------|------|------|------|------|-------|-------|
| Globe or Angle Valves, Screwedeach """ Flanged" | 2.80 | 2.80 | 3.00 | 4.00 | 5.00 | 7.25 | 11.00 | 16.00 |
| " " " Flanged" | 3.80 | 3.80 | 4.40 | 5.40 | 6.60 | 8.50 | 13.00 | 18.00 |
| Diameter of Flangesinches | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 71/2 |

GLOBE



Fig. 4833D

WITH YOKE



Fig. 4833E SCREWED

CROSS



Fig. 4833F

| Size inches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
|------------------|-------|-------|-------|-------|-------|-------|-------|----------------|-------|--------|--------|--------|--------|
| Globe Valveseach | 10.00 | 12.00 | 16.75 | 19.50 | 24.00 | 32.00 | 40.00 | 48.00 | 80.00 | 90.00 | 121.00 | 130.00 | 185.00 |
| Angle " . " | 10.00 | 12.00 | 16.75 | 19.50 | 24.00 | 32.00 | 40.00 | 48. 0 0 | 80.00 | 90.00 | 121.00 | 130.00 | 185.00 |
| Cross " . " | ١ | 16.00 | 21.00 | 26.00 | 30.00 | 42.00 | 45.00 | 58.00 | 90 00 | 100.00 | | | |

| | _ | | FLANC | GED | | | | | | | |
|----------------------------|--------|--------|--------|--------|--------------------|-------|-------|-----------------|-------|-------|--------|
| Size | | .inche | s 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 |
| Globe and Angle Valves. | | eacl | 11.75 | 14.00 | $\overline{18.50}$ | 1.50 | 26.00 | 34.00 | 42.00 | 50.00 | 80.00 |
| Cross Valves | | " | | 19.00 | 24.00 2 | 9.00 | 33,00 | 45.00 | 48.00 | 62.00 | 90.00 |
| Diam. Flanges | | | | | | | | | | | |
| Sizeinches | | 9 | 10 | 12 | 14 | | 16 | | 20 | - 1 | 24 |
| Globe or Angle Valves each | 90.00 | 121.00 | 130.00 | 185.00 | 334.0 | 00 40 | 0.00 | 540, 0 0 | 620. | 00 12 | 260.00 |
| Cross Valves " | 100.00 | | | 1 | | | | | 1 | . . | |
| Diam, of Flanges, inches | 131/4 | 15 | 16 | 19 | 21 | 1 22 | 316 | 25 | 271 | 6 3 | 3146 |

8

IRON BODY CHECK VALVES

JENKINS BROS.'

HORIZONTAL Screwed



HORIZONTAL Flanged



ANGLE Bcrewed



Fig. 763A

Fig. 763B

HORIZONTAL, ANGLE AND VERTICAL CHECK VALVES

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|-----------------|
| Price, Screwedeach | 8.00 | 11.00 | 14.00 | 17.00 | 20.00 | 25.00 | 30.00 | 40.00 | 65.00 | 80.00 |
| " Flanged :" | 10.00 | 13.00 | 16.50 | 20.00 | 23.00 | 28.00 | 33.00 | 43.00 | 65.00 | 80.00 |
| Diameter of Flanges inches | 6 | 7 | 71/2 | 81/2 | 9 | 914 | 10 | 11 | $12\frac{1}{2}$ | $13\frac{1}{2}$ |
| | | | | | | | | | | |

SELF-ADJUSTING SWING CHECK VALVES PLANGED SCREWED



Fig. 763D



Fig. 763E

| Size inches | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 8 | 10 |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|--------|
| Price, Screwed each | 12.00 | 16.00 | 19.00 | 23.00 | 33.00 | 44.00 | 92.00 | 146.00 |
| " Flanged " | 14.00 | 18.00 | 21.00 | 25.00 | 36.00 | 47.00 | 92.00 | 146.00 |
| Diameter of Flangesinches | 7 | 71/2 | 81/2 | 9 | 10 | 11 | 131/2 | 16 |

P. & C. IRON BODY SWING CHECK VALVES SCREWED PLANGED



Fig. .763F



Fig. 763G

| Language and the state of the s | | | | | | | | |
|--|---|------|----|------|----|----|----|----|
| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 7 |
| Priceeach Diameter of Flangesinches | | | | | | | | |
| Sizeinches | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
| Priceeach Diameter of Flanges,inches | | | | | | | | |

LUNKENHEIMER IRON BODY VALVES

For Working Pressures up to 125 Pounds

BRASS MOUNTED





Fig. 4788A



Fig. 4788B

| Sizeinches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|-------------------------------------|------|------|------|------|-------|-------|
| Price, Globe or Angle, Screwedeach | 2.25 | 2.75 | 3.50 | 5.40 | 7.35 | 9.80 |
| " " " " Flanged " " Cross Screwed " | 2.70 | 3.30 | 4.20 | 6.50 | 9.00 | 12.50 |
| " " Flanged " | 3.90 | 4.65 | 5.75 | 9.00 | 12.00 | 16.50 |

GLOBE

OUTSIDE SCREW AND YOKE ANGLE



Fig. 4788C



Fig. 4788D



Fig. 4788E

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 |
|-------------------------------------|----------|--------|--------|--------|--------|--------|
| Price, Globe or Angle, Screwed each | 7.00 | 9.00 | 12.50 | 15.25 | 19.00 | 24.00 |
| " " " Flanged " | 1.8.60 | 110.75 | 115.00 | 118.50 | 22.00 | 21.00 |
| " Cross Screwed " | 1.8 - 50 | 111.75 | 116.25 | 120.00 | 23.50 | 30.65 |
| " "Flanged" | 11.00 | 14.50 | 20.00 | 25.00 | 28.50 | 36.00 |
| Sizeinches | 5 | 6 | 7 | 8 | 10 | 12 |
| Price, Globe or Angle, Screwed each | 27.00 | 37.50 | 63.00 | 72.00 | 114.00 | 170.00 |
| " " " Flanged " | 131.00 | 142.00 | 168.00 | 77.00 | 123.00 | 187.00 |
| " Cross Corowed " | 25 95 | 47 95 | 78 00 | 92.00 | 162.00 | 240.00 |
| " Cross, Screwed" " "Flanged" | 130,20 | 11.20 | 1.0.00 | | | |

LUNKENHEIMER IRON BODY CHECK VALVES

BRASS MOUNTED

For 125 Pounds Working Pressure

HORIZONTAL







Fig. 4828A

LUNKENHEIMER

Fig. 4828B

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 10 | 12 |
|------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| Priceeach | 3.60 | 6.50 | 8.90 | 12.25 | 14.25 | 19.00 | 22.00 | 30.00 | 45.00 | 57.00 | 105.00 | 155.00 |

HORIZONTAL

FLANGED

ANGLE



Fig. 4828C



Fig. 4828D

| Sizenches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 10 | 12 |
|-----------|------|------|-------|-------|-------|-------|---------------|-------|---------------|-------|--------|--------|
| Priceeach | 5.25 | 8.25 | 11.50 | 15.50 | 18.00 | 22.50 | 2 6.00 | 35.00 | 50.0 0 | 62.00 | 115.00 | 175.00 |

REGRINDING SWING CHECK VALVES

SCREWED



Fig. 4828E



FLANGED

Fig. 4828F

| Size inches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 8 |
|---------------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price Screwedeach | 6.25 | 10.00 | 12.00 | 16.00 | 18.00 | 21.00 | 25,00 | 32,00 | 50.00 |
| " Flanged " | 8.00 | 12.00 | 14.50 | 19.00 | 21.00 | 24 50 | 99 00 | 37.00 | 55.00 |
| Diameter of Flangesinches | 6 | 7 | 71/2 | 81/2 | 9 | 91/4 | 10 | 11 | 131/6 |

EXTRA HEAVY IRON BODY GLOBE AND ANGLE VALVES

WITH YOKE AND HARD METAL SEATS

For 250 Pounds Working Pressure

GLOBE VALVE, FLANGED

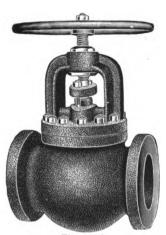


Fig. 311A



Fig. 311B

| Sizeinches | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 |
|------------------------------|-------|----------------|--------|--------|--------|-------|--------|
| Price, Screwedeach | 26.00 | 33.00 | 37.00 | 42.00 | 46.00 | 56.00 | 61.00 |
| " Flanged " | 27.50 | 35.00 | 40.00 | 45.00 | 50.00 | 60.00 | 65.00 |
| End to End Globe Valveinches | 91/2 | 103/4 | 1134 | 121/4 | 13 | 14 | 15 |
| Face " Face " " " | 101/2 | 111% | 121% | 1314 | 14 | 15 | 153/4 |
| Center to End Angle Valve " | 43/4 | 53/8 | 57/8 | 61/8 | 61/2 | 7 | 71/2 |
| " " Face " " " | 51/4 | 53/4 | 61/4 | 65/8 | 7 | 71/2 | 77/8 |
| Diameter of Flanges " | 61/2 | 71/2 | 814 | 9 | 10 | 101/2 | 11 |
| Sizeinches | 6 | 7 | 8 | 10 | 12 | 14 | 15 |
| Price, Screwedeach | 75.00 | 95.00 | 114.00 | 190.00 | | | |
| " Flanged" | 80.00 | 100.00 | 120.00 | 200.00 | 300.00 | | 400.00 |
| " with By-Pass" | | | | | 350.00 | | |
| Size of By-Passinches | | | 11/2 | 11/2 | 2 | 2 | 2 |
| End to End Globe Valve " | 161% | 181/4 | 20 | 2314 | | | |
| Face " Face " " " | 1716 | 1914 | 21 | 241% | 28 | 33 | 33 |
| Center to End Angle Valve " | 81/4 | 91/8 | 10 | 115/8 | | | |
| " " Face " " " | 834 | 95/8 | 101/6 | 1214 | 14 | 161% | 161% |
| Diameter of Flanges " | 121% | 14 | 15 | 1716 | 20 | 221% | 231% |

We do not recommend the use of Screwed Valves larger than 6 inches. The By-Pass on the Globe Valve is located on the right hand side looking at the inlet end that is, the end with the passage under the disc. On the Angle Valves it is located on the back, opposite the outlet.

It is desirable that all valves 8-inch and larger, should have a by-pass.



EXTRA HEAVY SWING CHECK VALVES

IRON BODY-HARD METAL SEATS

For 250 Pounds Working Pressure



Fig. 3802A

EXTRA HEAVY SCREWED

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 |
|----------------------------|--------------------------|--------------------------|-------------------------------|-------------------------------|---------------------------|-------------|
| Priceeach End to Endinches | $\underset{91_2}{26.00}$ | $33.00 \\ 10\frac{3}{4}$ | $\frac{37.00}{11\frac{3}{4}}$ | $\frac{42.00}{12\frac{1}{4}}$ | 46.00 13 | 56.00 14 |
| Sizeinches | 5 | 6 | 7 | 8 | 10 | |
| Price | 61.00 15 | $75.00 \\ 16\frac{1}{2}$ | $95.00 \\ 18\frac{1}{4}$ | 114.00 20 | $190.00 \\ 23\frac{1}{4}$ | :::: |

EXTRA HEAVY FLANGED

| Sizeínches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 |
|--|-------|-------|-------|-------|----|------|-------------------------------|
| Price | 101/2 | 111/2 | 121/2 | | 14 | | 153/4 |
| Sizeinches | 6 | 7 | 8 | 10 | 12 | 14 | 15 |
| Price each Face to Face inches Diameter of Flanges " | 171/2 | 1914 | 21 | 241/2 | 28 | | $400.00 \ 33 \ 23\frac{1}{2}$ |

HYDRAULIC SCREWED -For 800 Pounds Working Pressure

| Sizeinches | | | | | | | | |
|-----------------------------|-------------|----------------|---------------|-------|--------------|--------------|--------|--------|
| Price each End to Endinches | 30.00 12 | 40.00 131/6 | 55.00 1544 | 75.00 | 110.00 19 | 150.00 21 | 190.00 | 240.00 |

HYDRAULIC FLANGED - For 800 Pounds Working Pressure

| Size inches | 21/2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 |
|------------------------------|------|----|-------|-------|----|----|--------------|--------------|--------------|
| Priceeach Face to Faceinches | | | | 18 | 20 | 22 | 190.00 26 | 240.00 30 | 350.00 34 |
| Diam. of Flanges " | 83/4 | 10 | 111/2 | 131/2 | 15 | 16 | 17 | 21 | 231/2 |

LUNKENHEIMER EXTRA HEAVY IRON BODY VALVES

OUTSIDE SCREW AND YOKE, SPECIAL BRONZE COMPOSITION STEMS

For Working Pressures up to 250 Pounds ANGLE



GLOBE

Fig. 7725A

LUNKENHEIMER

LUNKENHEIMER

Fig. 7725B



Pig. 7725C

SCREWED

| 2 | 21/2 | 3 | 31/2 | 4 | 41/2 |
|-------|------------------------------|--|---|--|---|
| 29.00 | 33.00 | 37.00 | 42.00 | 46.00 | 53.00 |
| | | | | | |
| 61.00 | 75.00 | 95.00 | 114.00 | 190.00 | 285.00 |
| | 29.00 35.00 5 61.00 | 29.00 33.00 35.00 40.00 5 6 61.00 75.00 | 29.00 33.00 37.00 35.00 40.00 45.00 | 29.00 33.00 37.00 42.00 35.00 40.00 45.00 50.00 5 6 7 8 61.00 75.00 95.00 114.00 | $\begin{array}{ c c c c c c c c c }\hline 2 & 21/2 & 3 & 31/2 & 4\\\hline 29.00 & 33.00 & 37.00 & 42.00 & 46.00\\\hline 35.00 & 40.00 & 45.00 & 50.00 & 55.00\\\hline \hline 5 & 6 & 7 & 8 & 10\\\hline 61.00 & 75.00 & 95.00 & 114.00 & 190.00\\\hline 75.00 & 95.00 & 120.00 & 145.00 & 240.00\\\hline \end{array}$ |

FLANGED

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 |
|----------------------------------|-------|--------|--------|--------|--------|--------|
| Price, Globe or Angleeach | 31.00 | | 40.00 | 45.00 | 50.00 | 57.00 |
| " Cross " | 38.00 | 43.00 | 50.00 | 55.00 | 60.00 | 68.00 |
| Diameter of Flangesinches | 61/2 | 71/2 | 81/4 | 9 | 10 | 101/2 |
| Face to Face Globe " | 934 | 11½ | 121/2 | 131/2 | 14 | 15 |
| Center to Face, Angle or Cross | 478 | 534 | 61/4 | 63/4 | 7 | 71/4 |
| Sizeinches | 5 | 6 | 7 | 8 | 10 | 12 |
| Price, Globe or Angleeach | 65.00 | 80.00 | 100.00 | 120.00 | 200.00 | 300.00 |
| " Cross " | 80.00 | 100.00 | 125.00 | 150.00 | 250.00 | 375.00 |
| Diameter of Flangesinches | 11 | 121/2 | 14 | 15 | 171/2 | 20 |
| Face to Face, Globe " | 1534 | 171/2 | 191/4 | 213/4 | 253% | 285% |
| Center to Face, Angle or Cross " | 77/8 | 83/4 | 95/8 | 101/2 | 1214 | 14 |

IRON BODY VALVES

BUTTERFLY





| TANDARD | |
|---------|--|
|---------|--|

| Sizeinches | 2 | 2 4 | 3 | 3 4 | 4 | 5. | 6 | 8 | 10 | 12 | 14 | 16 |
|-------------|------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
| Screwedeach | 8.00 | 9.50 | 12.00 | 16.00 | 18.50 | 28.50 | 42.50 | | | | | |
| Flanged " | 9.50 | 11.50 | 15.00 | 19.00 | 22.00 | 32.00 | 47.00 | 90.00 | 125.00 | 160.00 | 275.00 | 350.00 |

LUNKENHEIMER

| Sizeinche | 11/2 | 2 | $2\frac{1}{2}$ | 3 |
|-----------|------|------|----------------|-------|
| Priceeac | 7.00 | 8.00 | 9.50 | 12.00 |

THROTTLE

"HANDY" LEVER GATE

LUNKENHEIMER LEVER THROTTLE







Fig. 8448D



Fig. 8448E

THROTTLE

| Sizeinches | | | | |
|--------------------|-------|-------|-------|-------|
| Price, Screwedeach | 30.00 | 40.00 | 50.00 | 60.00 |

LUNKENHEIMER "HANDY" LEVER GATE For Working Pressures not to Exceed 75 Pounds

| | | | . — | | r | | | | _ | | | |
|------------|------|-------|-----|------|---|------|---|-------|-------|--|--|--|
| Sizeinches | 2 | 21/6 | 3 | 31/6 | 4 | 41/2 | 5 | 6 | - 8 | | | |
| Priceeach | 7.00 | 12 00 | ' | | | | | 35 00 | 65 00 | | | |

LUNKENHEIMER LEVER THROTTLE For Working Pressures Up to 150 Pounds

| Sizeinche | 3 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 |
|------------|------|-------|-------|-------|-------|-------|-------|
| Price eacl | 8.50 | 16.00 | 20.00 | 25.00 | 30.00 | 35.00 | 40.00 |

STANDARD IRON BODY GATE VALVES

WEDGE PATTERN

SCREWED



Fig. 6314A

FLANGED



Fig. 6314B

HUB END



Fig. 6314C

SCREWED

| Sizeinches | | | 3 | 31/2 | 4 | 41/2 | 5 |
|------------|-------|-------|-------|-------|-------|--------|-------|
| Price each | 10.00 | 12.00 | 15.00 | 18.00 | 20.00 | 23.00 | 25.00 |
| Sizeinches | | 7 | 8 | 9 | 10 | 12 | |
| Price each | 30.00 | 45.00 | 55.00 | 80.00 | 90.00 | 125.00 | |

FLANGED

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|---|--------------------|--|--|---|--|--|---|---------------------|
| Price each Face to Faceinches Diam. Flanges " | 10.00 7 6 | $ \begin{array}{r} 12.00 \\ 7\frac{1}{2} \\ 7 \end{array} $ | 15.00 8 7½ | 18.00 81/2 81/2 | 20.00 9 9 | $\begin{array}{r} 23.00 \\ 9\frac{1}{2} \\ 9\frac{1}{4} \end{array}$ | 25.00 10 10 | 30.00 10½ 11 |
| Sizeinches | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 |
| Price each Face to Faceinches Diam. Flanges " | 45.00 11 12½ | 55.00 11½ 13½ | 80.00 12 15 | 90.00 13 16 | 125.00 14 19 | 190.00 15 21 | $240.00 \\ 15 \\ 2214$ | 275.00 16 23½ |
| Sizeinches | 18 | 20 | 22 | 24 | 26 | 28 | 30 | |
| Price each Face to Face.inches Diam. Flanges " | 375.00 17 25 | $\begin{array}{c} 425.00 \\ 18 \\ 27\frac{1}{2} \end{array}$ | $ \begin{array}{r} 525.00 \\ 19 \\ 29\frac{1}{2} \end{array} $ | $ \begin{array}{r} 600.00 \\ 20 \\ 32 \end{array} $ | $ \begin{array}{r} 800.00 \\ 23 \\ 34\frac{1}{4} \end{array} $ | $ \begin{array}{r} 1000.00 \\ 26 \\ 36\frac{1}{2} \end{array} $ | $\begin{array}{c c} 1200.00 \\ 30 \\ 38\frac{3}{4} \end{array}$ | |

HUB END

| Sizeinches | 2 | ~ 3 ¯ | 4 | 5 | 6 | 7 | 8 | 10 |
|-------------------|--------|-------|--------|--------------------|--------|--------|--------|---------|
| Price each | | 15.00 | 20.00 | 25.00 | 30.00 | 45.00 | 55.00 | 90.00 |
| End to Endinches | 81/2 | 9 | _ 1014 | $=\frac{101/4}{4}$ | 1034 | 1034 | 12 | 1234_ |
| Sizeinches | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 30 |
| Price each | 125.00 | | | | | | | 1200.00 |
| " With By-Pass. " | | | 350.00 | 450.00 | 525.00 | 625.00 | 725.00 | 1400.00 |
| End to Endinches | 131/2 | 1334 | 16 | 17 | 17 | 171/6 | 18 | 30 |

STANDARD IRON BODY GATE VALVES

WEDGE PATTERN





Fig. 773A

WITH INDICATOR



Fig. 773B

QUICK OPENING

| Size inches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|---|----------------|---------------------------------|----------|------------------|----------|-----------------|-------------------|---|
| Price, Screwedeach Flanged | 16.00 16.00 | 18.00 | 22.00 | 25 00 | 27.00 | 3 0.00 | 34.00 | 40.00 |
| Diameter of Flanges inches Face to Face Flanged " | 6 7_ | 7 7½ | 7½ 8 | 81/2 | 9 | $91\frac{4}{2}$ | 10 10 | 11 10⅓ |
| Size inches | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 |
| Price, Screwedeach "Flanged" | 57.00 57.00 | | | 110.00 110.00 | | | 275.00 | 325.00 |
| Diameter of Flangesinches Face to Face Flanged " | 12½ 11 | $13\frac{1}{2}$ $11\frac{1}{2}$ | 15 12 | 16 13 | 19 14 | 21 15 | $\frac{22!4}{15}$ | $\begin{array}{c} 23^{1}_{2} \\ 16 \end{array}$ |

WITH INDICATOR

| Size inches | 2 | 21/2 | 3 | 3½ | 4 | 41/2 | 5 | 6 |
|---|--------------------|------------------|--|----------------------|--------------------|---|--|--|
| Price, Flangedeach Diameter of Flangesinches Face to Face | 15.00 6 7 | 18.00 7 7½ | $ \begin{array}{r} \hline 22.00 \\ 7\frac{1}{2} \\ 8 \end{array} $ | 27.00 8½ 8½ | 30.00 9 9 | 34.00 91 ₄ 91 ₂ | 36.00 10 10 | 44.00 11 10½ |
| Size inches | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 |
| Price, Flangedeach Diameter of Flangesinches Face to Face | 60.00 12½ 11 | | $100.00 \\ 15 \\ 12$ | $115.00 \\ 16 \\ 13$ | 155.00 19 14 | $225.00 \\ 21 \\ 15$ | $\begin{array}{r} 275.00 \\ 22_{-4} \\ 15 \end{array}$ | $ \begin{array}{r} 325.00 \\ 23^{1}2 \\ 16 \end{array} $ |

Gate valves with indicator are especially for service in mills, factories, etc., in connection with automatic fire sprinkler pipes or any other water system. They are recommended by The Associated Factory Mutual Fire Insurance Companies.

The indicator attachment enables the operator to determine at a glance the position of valves, when open, partly open, or shut.

IRON BODY GATE

SCREWED



FLANGED



Fig. 778A



Fig. 778B

| Size inches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 |
|---|-------|-------|-------|-------|-------|--------|-------|
| Price, Screwed each "Flanged " Diameter of Flanges inches | 9.00 | 13.00 | 16.00 | 19.00 | 22.50 | 31.00 | 32.00 |
| Size inches | 6 | 7 | 8 | 9 | 10 | 12 | |
| Price, Screwed each "Flanged " Diameter of Flanges inches | 38.00 | 50.00 | 62.00 | 71.00 | 85.00 | 120.00 | |

SCREWED

PRATT & CADY With Renewable Seat Rings

· FLANGED



Fig. 778C



Fig. 778D

| Sizeinches | *2 | *21/2 | *3 | *31/2 | 4 | 41/2 | 5 | 6 |
|------------------------------|-----------------|-------|-------|-------|--------|--------|--------|-------|
| Price, Screwedeach "Flanged" | 7.50 | 10.75 | 14.00 | 18.25 | 22.00 | 25.00 | 27.00 | 34.00 |
| Diameter of Flanges inches | 6 | 7 | 71/2 | 81/2 | 9 | 91/4 | 10 | 11 |
| Sizeinches | 7 | 8 | 9 | 10 | 12 | 14 | 16 | |
| Price, Screwedeach "Flanged" | 41.00 | 51.50 | 63.00 | 73.00 | 100.00 | 168.00 | 223.00 | |
| Diameter of Flangesinches | $12\frac{1}{2}$ | 131/2 | 15 | 16 | 19 | 21 | 231/2 | |

^{*}Sizes 2, 21/2, 3 and 31/2-inch have screwed packing nut.

LUNKENHEIMER DOUBLE SEATED "CLIP" GATE VALVES

For Working Pressure up to 100 Pounds

IRON BODY BRASS MOUNTED OR ALL IRON

4 to 2 inches

214 to 6 inches

SCREWED

FLANGED 2% to 6 inches







Fig. 2399B



Pig. 2399C

These valves are unequaled for use where pressure does not exceed 100 pounds. Simple in construction, compact, strong, well made and very durable. No complicated mechanism. The wedge shaped disc is either solid bronze or iron and faced with bronze rings (according to the size) and seats on both sides against correspondingly tapered seat rings. The stuffing boxes on sizes up to and including 2 inches, and the stems on all sizes of valves are also made of bronze.

Take pressure from either end, and can be connected in any position. The hub or bonnet of the valve is secured to the body by means of a round steel clip, which surrounds the body and passes through lugs on sizes of hub and is fastened by means of two nuts. This simple arrangement permits of easy access to the interior of the valve at all times.

Joint between the hub and the body is indestructible and consists of a seamless copper wire gasket partially imbedded in the top surface of the valve body. The portion which protrudes above said surface, forming a joint against the under face of the hub when the two parts are connected together. The construction also permits of repacking the stuffing box while the valve is open or closed.

Can be furnished with English standard pipe threads or flanges when so desired.

| Sizeinches | 1/2 | 3/4 | 1 | 114 | 11/2 | 2 | 2^{1} |
|---|--------------|-------|-------|----------------|-------|-------|---------|
| Price, Screwed, Iron Body, Brass Mounted.each | 1.50 | 1.90 | 2.50 | 3.50 | 5.00 | 7.50 | 12.00 |
| "Flanged" "" " " | | | 3.co | 4.90 | 6.00 | 8.50 | 13.50 |
| " Screwed, All Iron " | 1.50 | 1.90 | 2.50 | 3.50 | 5.00 | 7.50 | 12.00 |
| " Flanged " "" | | 1 | 3.00 | 4.90 | 6.00 | 8.50 | 13.50 |
| Face to Face, Flangedinches | | | | | | 4 | 415/6 |
| " " Screwed " | 2^{1}_{16} | 2.7 | 213_ | $2\frac{3}{4}$ | 3 | 376 | 4 32 |
| Sizeinches | 3 | 3L, | 4 | 414 | 5 | 6 | |
| Price, Screwed, Iron Body. Brass Mounted each | 15.00 | | | | | | |
| "Flanged""""" | 16.90 | | | | | | |
| " Screwed, All Iron" | 15.00 | 18.00 | 20.00 | 23.00 | 25.00 | | |
| " Flanged " " " | 16.90 | 20.30 | 22,50 | 26.00 | 28.30 | 33.80 | |
| Face to Face, Flangedinches | 516 | 534 | 69/6 | 615/ | 734 | 83/6 | |
| " " " Screwed " | 4 13 | 51% | 5.8 | 635 | 7 | 7 13 | |

Flanged valves also made in 1 to 2-inch sizes inclusive, with same style handle as the 1/2 to 2-inch size screwed end valve as illustrated above.

LUNKENHEIMER IRON BODY GATE VALVES

MEDIUM PATTERN VICTOR
No. 243
STATIONARY OUTSIDE SCREW S
STEM AND YOKE

No. 602 STATIONARY STEM

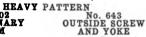










Fig. 5609A

Fig. 5609B

Fig. 5609C

Fig. 5609D

| ME | WEDIOM PALLERIN—LOL 139 Lonner Molking Leaguing | | | | | | | | | | | |
|--------------------------------|---|--------|--------|----------------|--------|----------------|--------|--------|--------|--------|--|--|
| Size inches | 2 | 21/2 | 3 | 31/2 | 4 | 41 2 | 5 | 6 | 7 | 8 | | |
| No. 243, 8cr'd or Fl'g'd, each | 9.00 | 11.00 | 14.00 | 22.00 | 29.00 | 34.00 | 42.00 | 53.00 | 60.00 | 75.00 | | |
| 242 | 12.00 | 15.00 | 19.00 | 30.00 | 38.00 | 42.50 | 45.00 | 61.00 | 75.00 | 94.00 | | |
| Face to Faceinches | 5 | 511/6 | 61/8 | $6\frac{1}{2}$ | 71/8 | $7\frac{1}{2}$ | 815/6 | 91/2 | 10 % | 1134 | | |
| Size inches | 9 | 10 | 12 | 14 | 15 | 16 | 18 | 20 | 22 | 24 | | |
| No.243, Ser'd or Fl'g'd, each | 90.00 | 115.00 | 160.00 | 190.00 | 220.00 | 250.00 | 300.00 | 400.00 | 530.00 | 650.00 | | |
| 242 | | | | | | | | | | 670.00 | | |
| Face to Faceinches | $12\frac{1}{2}$ | 144 | 15 | 161/2 | 163/4 | 181/2 | 22 | 24 | 25 | 26 | | |
| A 1 | 1 | | A- 16 | 1:L | 1 | | | | | | | |

Above valves made screwed up to 12-inch only.

HEAVY PATTERN-Stationary Stem for 175 Pounds Working Pressure

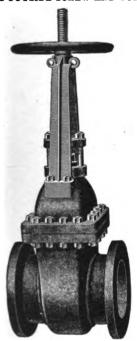
| Size inches | 2 | 21/2 | 3 | 312 | 4 | 41/2 | | 6 | 7 | 8 |
|-----------------------|-------|--------|-----------------|--------|--------|--------|--------|--------|--------|--------|
| No. 602, Screwed each | 9.00 | | 14.00 | | | | | | | 75.00 |
| " 603, Flanged " | 11.70 | 14.00 | 17.50 | 26.00 | 33.00 | | | | | 83.00 |
| Face to Faceinches | 658 | 75/8 | 81/2 | 85/8 | 9_ | 95/8 | 101/4 | 107/8 | 121/8 | 1318 |
| Size inches | 9 | 10 | 12 | 14 | 15 | 16 | 18 | 20 | 22 | 24 |
| No. 602, Screwed each | 90.00 | 115.00 | 160.00 | | | | | | | |
| " 603, Flanged " | 99.00 | 125.00 | 175.00 | 195.00 | 250.00 | 275.00 | 315.00 | 415.00 | 560.00 | 675.00 |
| Face to Face inches | 14 | 155/8 | $16\frac{1}{2}$ | 18 | 183% | 201/8 | 235/8 | 255/8 | 265/8 | 2734 |

| I acc to I acc incare | 1 | 10/8 | 10/2 | | 10.8 | 1 = 0 / 8 | /8 | | 1 =0.8 | 1 - 1/4 |
|-----------------------|------------------------------------|--------|---------|--------|---------|-----------|--------|--------|---------|---------|
| HEAVY PAT | TERN | -Outsi | de Scre | w and | Yoke fo | r 175 P | ounds | Workin | g Press | ure |
| Size inches | 2 | 21/2 | 3 | 31 2 | 4 | 41 2 | 5 | 6 | 7 | 8 |
| No. 642, Screwed each | 12.00 | | 19.00 | | | | | | | 94.00 |
| " 643, Flanged " | 15.00 | 18.00 | 22.50 | 34.00 | 42.00 | 45.50 | | | | 105.00 |
| Face to Face inches | 6^{5} $\stackrel{\checkmark}{s}$ | 75 8 | 81/2 | 85 8 | 9 | 95% | 1014 | 107/8 | 1218 | 1318 |
| Size inches | 9 | 10 | 12 | 14 | 15 | 16 | 18 | 20 | 22 | 24 |
| No. 642, Nerewed each | 112.00 | 135.00 | 175.00 | | | | | | | |
| " 643, Planged " | 125.00 | 150.00 | 185.00 | 205.00 | 250.00 | 300.00 | 330.00 | 425.00 | 600.00 | 700.00 |
| Face to Face inches | 14 | 155% | 1614 | 18 | 183/8 | 201/8 | 235% | 255% | 265/8 | 2734 |

IRON BODY GATE VALVES

WEDGE PATTERN

WITH OUTSIDE SCREW AND YOKE



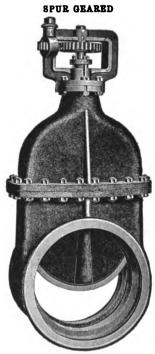


Fig. 775B

Fig. 775A Fig WITH OUTSIDE SCREW AND YOKE

2 6 Sizeinches 21/2 31/2 41/2 Price. Screwed....each
"Flanged...." 18.00 20.00 23.00 40.00 28.00 33.00 46.00 55.00 18.00 20.00 23.00 28.00 33.00 40.00 46.00 55.00 Sizeinches 7 8 9 10 12 14 15 16 Price, Screwed each 70.00 90.00 115.00 135.00 170.00 Flanged..... " 240.00 300.00 350.00 70.00 90.00 115.00 135.00 170.00 Size....inches | 18 28 30 22 24 26 20 Price, Flanged.....each 475.00 550.00 650.00 750.00 1000.00 1200.00 1400.00

SPUR GEARED, FLANGED OR HUB ENDS

| Sizeinches | 16 | 18 | 20 | 22 | 24 | 26 |
|---------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Priceeach " with By-Pass" | 375.00 450.00 | 475.00 550.00 | 550.00 650.00 | 650,00 750,00 | 725.00 850.00 | 1000,00 1200,00 |
| Sizeinches | 28 | 30 | 36 | 42 | 48 | |
| Priceeach with By-Pass " | 1200.00 1400.00 | 1400.00 1600.00 | 2000.00 2200.00 | 3000.00 3300.00 | 4200.00 4600.00 | |

EXTRA HEAVY IRON BODY GATE VALVES

HARD METAL SEATS

For 250 Pounds Working Pressure



Fig. 4206A

SCREWED

| Sizeinches | 11/4 | 1½ | 2 | 21/2 | 3 | 31/2 | 4 |
|----------------------------|-------|-------|-----------------|---------------|---------------|--------------|--------------|
| Priceeach End to Endinches | | | | | | 45.00 10 | 50.00 11 |
| Sizeinches | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 |
| Priceeach End to Endinches | 60.00 | 65.00 | 80.00 15 1/8 | 100.00 16¼ | 120.00 16½ | 160.00 17 | 200,00 18 |

FLANGED

| Sizeinches | 11/4 | 1½ | 2 | 21/2 | 3 | 3½ | 4 | 41/2 | 5 |
|------------------------|----------------|------------|----------------|-------------|-----------------|-----------------|-----------------|-----------------|--------------------|
| Priceeach | 20.00 | 22.50 | 27.50 | 35.00 | 40.00 | 45.00 | 50.00 | 60.00 | 65.00 |
| Diam. of Flangesinches | 5 | 6 | 6½ | 71/2 | 81/4 | 9 | 10 | 101/2 | 11 |
| Face to Face " | $6\frac{1}{2}$ | 71/2 | 81/2 | 91/2 | 111/8 | 11% | 12 | 131/4 | 15 |
| Bolt Circle " | 334 | 41/2 | 5 | 5 1/8 | $6\frac{5}{8}$ | 71/4 | 71/8 | 81/2 | 91/4 |
| Size of Bolts " | 1/2 | 58 | 5/8 | 34 | 5/8 8 | 5 ₈ | 34 8 | 8 | 3 <u>/4</u> 8 |
| Number of Bolts | 4 | 4 | 4 | 4 | 8 | 8_ | 8 | 8 | 8 |
| Sizeinches | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 |
| Price each | 80.00 | 100.00 | 120.00 | 160.00 | 200.00 | 300.00 | 400.00 | 400.00 | 550.00 |
| Diam. of Flangesinches | 1212 | | 15 | 16 | 171/2 | | $22\frac{1}{2}$ | 231/2 | 25 |
| Face to Face " | 1578 | | 16½ | 17 | 18 | $19\frac{3}{4}$ | 221/2 | $22\frac{1}{2}$ | 24 |
| Bolt Circle " | 1058 | | 13 | 14 | $15\frac{1}{4}$ | 1734 | 20 | 21 | 221/2 |
| Size of Bolts " | 34 | ₹ 8 | ₹ ₈ | <i>7</i> ∕8 | ₹8 | ₹8 | $\frac{7}{20}$ | 1 | 1 |
| Number of Bolts | 12 | 12 | 12 | 12 | 16 | 16 | 20 | 20 | 20 |

EXTRA HEAVY IRON BODY GATE VALVES

WITH BY-PASS AND HARD METAL SEATS

For 250 Pounds Working Pressure

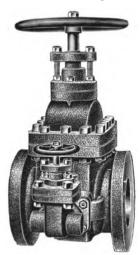
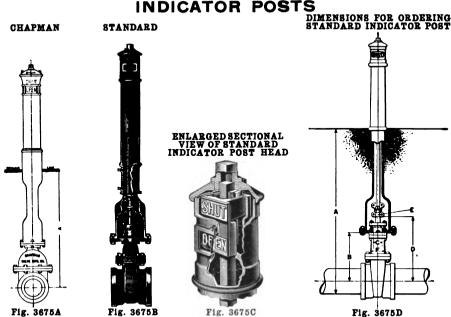


Fig. 6494A FLANGED

| Sizeinches | 6 | 8 | 10 | 12 |
|-----------------------|--------|-----------|-------------|------------|
| Priceeach | 110.00 | 150.00 | 250.00 | 350.00 |
| Face to Faceinches | 151/8 | 161/2 | 18 171⁄2 | 1934 |
| Diameter of Flanges " | 121/3 | 16½ 15 | 171% | 20 |
| By-Pass | 11/2 | | 11/2 | ${f 2}$ |
| Bolt Circle | 105% | 1½ 13 | 1517 | 173/ |
| Size of Bolts " | 3/4 | 76 | 7/3 | 7/6 |
| Number of Bolts | 12 | 12 | 16 | 1 6 |

| WITH | WITH OUTSIDE SCREW AND YOKE | | | | | | | | | |
|--|--|--|--|--|--|---|--|--|--|--|
| Sizeinches | 6 | 7 | 8 | 9 | 10 | 12 | 14 | | | |
| Price each Face to Face. inches Diameter of Flanges. " By-Pass. " Bolt Circle. " Size of Bolts. " Number of Bolts. | 135.00 157/8 121/2 11/4 105/8 3/4 12 | 155.00 16 ¹ / ₄ 14 11 ¹ / ₈ 11 ⁷ / ₈ 12 | 185.00 16½ 15 1½ 13 ⁷ / ₈ 12 | 240.00 17 16 1½ 14 ½ 18 12 | $\begin{array}{c} 300.00 \\ 18 \\ 17\frac{1}{2} \\ 1\frac{1}{2} \\ 15\frac{1}{4} \\ \frac{7}{8} \\ 16 \end{array}$ | $\begin{array}{c} 400.00 \\ 19^{3}4 \\ 20 \\ 2 \\ 17^{3}4 \\ 7^{8} \\ 16 \end{array}$ | 500.00 22½ 22½ 22½ 20 7/8 20 | | | |
| Sizeinches | 15 | 16 | 18 | 20 | 22 | 24 | | | | |
| Price each Face to Face inches Diameter of Flanges By-Pass Bolt Circle Size of Bolts Number of Bolts | 500.00 22½ 23½ 2 21 1 20 | 650.00 24 25 3 22½ 1 20 | 850.00 26 27 3 24½ 1 24 | 1150.00 28 291/2 4 263/4 11/8 24 | 1450.00 29½ 31½ 4 28¾ 1½ 28 | 1850.00 31 34 4 311/4 11/8 28 | | | | |



The object of the Indicator Post is to provide means for opening underground valves and to furnish a positive indicator to show whether the valves are open or closed. They are used principally in connection with Fire Protection Service, in factory, mill yards, grounds of public buildings, street mains, etc., but may with advantage be used at any point where the valve is underground. The use of the Indicator Post does away with the annoyance and delay of searching for a valve box, which may be covered with snow or dirt.

The device consists of a strong, cast iron, tubular, adjustable post, made in two sections, projecting above ground, extending below the surface where it is fastened by the studs of the stuffing box. The stem of the valve is joined to square operating rod by strong malleable iron clamps, clamped with four bolts. The indicator or tell-tale driven by a thread on the spindle, rises and falls with the gate or plug, and by exposing the words Open and Shut at the top of the post, shows at a glance whether the valve is open or closed. The letters are of large size and very distinct and durable. These posts can be used with any size or make of valve and we furnish it complete with valve, or separate for use with existing valves. The size and shape of the operating rod is made to conform with the standard of the system with which the valves are to be used.

In ordering give:

Size and kind of valve.
Depth of trench.
Number of turns to open.
Whether valve turns to right or left to open.
Center of pipe to top of stuffing box flange.
Center of pipe to bottom of valve stem square.
Diameter of stuffing box.
Size of square on valve stem.
Height of square on valve stem.
Height of thread end on valve stem.
Diameter of bolt circle in stuffing box.
Diameter of studs in stuffing box.

Number of stude in stuffing box.

Prices upon application.

FOOT VALVES WITH STRAINERS

BRASS



Fig. 766.1

* to 6-Inch



Fig. 766B

IRON BODY



Fig. 766C

BRASS

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 1½ | 2 | 21/2 | 3 |
|------------|------|------|------|------|------|------|-------|-------|
| Priceeach | 1.50 | 1.50 | 2.00 | 2.75 | 3.75 | 5.50 | 12.00 | 16.00 |

IRON BODY, SCREWED

| Sizeinches | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 |
|-------------------|-------|-------|-------|-------|-------|-------|-------|--------|
| Price, Blackeach | 1.15 | 1.30 | 1.40 | 1.90 | 2.40 | 3.30 | 3.90 | 5,60 |
| | 1.75 | 2.00 | 2.10 | 2.85 | 3.60 | 5.CO | 5.75 | 8.50 |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 10 | 12 |
| Price, Black each | 7.30 | 10.50 | 11.25 | 14.75 | 35.00 | 41.00 | 64.00 | 100.00 |
| " Galvanized " | 11.00 | 15.75 | 16.75 | 22.00 | ١ | ١ | | l |

IRON BODY, FLANGED

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|---------------------------|-------|-------|-----------------|--------|--------|--------------------|--------|-------|
| Priceeach | 3.50 | 4.50 | 5.75 | 7.50 | 9.50 | 13.00 | 14.00 | 17.50 |
| Diameter of Flangesinches | 6 | 7 | 716 | 81/2 | 9 | 91/1 | 10 | 11 |
| Height " | 51/2 | 63g | 7 - | 91/8 | 91/8 | $11^{\frac{3}{3}}$ | 113/8 | 123/4 |
| Outside Diameter " | 6 | 7 | 71/2 | 87% | 9 | 101/2 | 101/2 | 1134 |
| Sizeinches | 7 | 8 | 10 | 12 | 14 | 15 | 16 | |
| Price each | 38.00 | 45.00 | 70.00 | 112.00 | 150,00 | 175.00 | 200.00 | |
| Diameter of Flangesinches | 121/2 | 131/2 | 16 | 19 | 21 | 221/4 | 231/2 | |
| Height " | 113/8 | 1317 | 181/2 | 18 | 1934 | $21\frac{3}{4}$ | 241/2 | |
| Outside Diameter " | 131/8 | 1514 | $19\frac{5}{8}$ | 201/4 | 241/8 | | 27 | |

IRON BODY WITH NEST OF GATES, FLANGED

Rubber Valves

| Sizeinches | 16 | 18 | 20 | 24 | 30 |
|--|--------|--------|--------|--------|--------|
| Priceeach Diameter of Flangesinches H ight | 190.00 | 235.00 | 265.00 | 400.00 | 780,00 |
| | 23½ | 25 | 27½ | 32 | 383/4 |
| | 17¾ | 217/8 | 24 | 29 | 35 |
| | 34¾ | 403/ | 46 | 541/6 | 691/4 |

EMERSON STRAINERS AND FOOT VALVES

QUICK CLEANING STRAINERS

STRAINER WITH FOOT VALVE



Fig. 5150A

STRAINER WITHOUT FOOT VALVE



Fig. 5150B

| Suction Pipeinches | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 7 | 8 |
|---|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|
| Price, Strainer and Foot Valve each without " | 11.50 5.75 | 12.00 6.00 | 16.25 8.12 | 18.00 9.00 | 20.00 10.00 | 26.25 13.12 | 33.00 16.50 | 38.50 19.25 | 44.75 22.37 |
| Suction Pipeinches | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | ••••• |
| Price, Strainer and Foot Valve each | | | | | | | | | |

The illustrations of the Emerson Strainers shows them attached to suction pipe and partially raised by ropes fastened to the lugs in the strainer collar.

The other ends of the ropes are always kept above the water.

When the strainer is lowered in position, it closes the space between the base and the suction pipe so that nothing can enter the latter except through the perforations in the strainer.

FOOT VALVES FOR CENTRIFUGAL PUMPS

| For Pumpnumber | 11/2 | 134 | 2 | 21/2 | 3 | 4 | 5 | 6 |
|------------------------|--------------|--------------|---------------|---------------|---------------|----------------|----------------|----------------|
| Price, Iron each Brass | 5.00 8.00 | 6.00 9.00 | 7.00 12.00 | 8.00 15.00 | 9.00 18.00 | 12.00 25.00 | 15.00 30.00 | 20.00 40.00 |
| For Pump number | 8 | 10 | 12 | 15 | 18 | 20 | 24 | |
| Price, Ironeach | 30.00 | 40.00 | 50.00 | 75.00 | 110.00 | 140.00 | 175.00 | |

No extra charge for strainers on iron valves.



RADIATOR AIR VALVES

PERFECTED DUPLEX









2.00

| Number | Т |
|------------|----|
| Price each | 1- |

FOUR-WAY DRAIN VALVES









 $egin{array}{c|c|c|c} 1 & 3 & 6 \\ \hline 50 & 1.50 & 2.00 \\ \hline \end{array}$

| | 118.0201 | 1181000 | | | 1 1g. 02011 | | |
|--------|----------|---------|---|------|-------------|------|--|
| Number | | | 1 | 2 | 3 | 4 | |
| | ••••• | | | 3.00 | 2.00 | 3.00 | |

FOUR-WAY DRAIN VALVES







Fig. 525J Fig. 525K

Fig. 5251

 Number
 6
 7

 Price
 each
 3.00
 3.00

Special Attachment prevents the Valve from being turned or removed from the Radiator. It is sold only in connection with the No. 6 Perfected Duplex and Four-Way Drain Valves, price, per dozen. 12.00.

AIR COCKS

Steam Metal

T HANDLE

STRAIGHT NOSE



Fig. 787A

MALE BOTH ENDS



Fig. 787B

BIBB NOSE



Fig. 787C

STRAIGHT NOSE

| JIIIAIGIII | 11002 | | | | | |
|------------|-------|------|-----|-----|-----|------|
| Sizeinches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 |
| Priceeach | .40 | . 45 | .50 | .60 | .90 | 1.15 |

MALE BOTH ENDS

| Sizeinches | 1/8 | 1/4 | 3/8 | 1/2 |
|------------|-----|-----|-----|-----|
| Priceeach | .55 | .65 | .75 | .90 |

BIBB NOSE

| Sizeinches | | 1/4 | 3/8 | 1/2 |
|-----------------------|-----|------|------|------|
| Price, Plain Noseeach | .70 | .80 | .90 | 1.00 |
| " Threaded Nose " | .80 | 1.00 | 1.10 | 1.35 |

LEVER HANDLE

STRAIGHT NOSE



Fig. 787D

MALE BOTH ENDS



Fig. 787E

BIBB NOSE



Fig. 787F

STRAIGHT NOSE

| Sizeinches | 1/8 | . 14 | 3/8 | 1/2 | 34 | 1 |
|------------|-----|------|-----|-----|------|------|
| Priceeach | .55 | .60 | .65 | .75 | 1.05 | 1.30 |

MALE BOTH ENDS

| Sizeinches | 1/8 | 1/4 | 3/8 | 1/2 |
|------------|-----|-----|-----|------|
| Priceeach | .70 | .80 | .90 | 1.05 |

BIBB NOSE

| Sizeinches | 1/8 | 1/4 | 3/8 | 3/2 |
|------------------------|-----|------|------|------|
| Price, Plain Nose each | .85 | .95 | 1.05 | 1.15 |
| " Threaded Nose " | .95 | 1.15 | 1.25 | 1.50 |

AIR AND CYLINDER COCKS

T HANDLE

AIR COCKS

____LE

LEVER HANDLE

Male and Female

Female Both Ends

Male and Female

Female Both Ends









Fig. 621A

Fig. 621B

Fig. 621C

Fig. 621D

T HANDLE MALE AND FEMALE

| 0: | i | 1/ | 1, | 9/ | 1 1/ |
|-------|--------|------|-------|-----|-------------------|
| Size | inches | -/0 | 1 1/4 | 9/2 | l 1/ 6 |
| | | | | / 6 | |
| D-: | | 75 | Of. | OF | 1 15 |
| Price | eacn | . 10 | | .95 | 1.10 |
| | | | | | |

T HANDLE FEMALE BOTH ENDS

| Size | inches | 1/6 | 1.4 | 3, 3 | 1/6 |
|---|--------|-----|-----|------|------|
| Sibe | | | | /8 | /2 |
| Price | each | 75 | 85 | 95 | 1 15 |
| *************************************** | | | .00 | .00 | 1.10 |

LEVER HANDLE MALE AND FEMALE

| Size | inches | 1/8 | 1/4 | 3/8 | 1∕2 |
|-------|--------|-----|------|------|------|
| Price | each | .90 | 1.00 | 1.10 | 1.30 |

LEVER HANDLE FEMALE BOTH ENDS

| Sizeinches | 1/6 | 1/4 | 3. | 1/6 |
|------------|-----|------|------|------|
| T | -/0 | | | |
| rnceeach | .90 | 1.00 | 1.10 | 1.30 |

CYLINDER COCKS

WITH UNION
Lever Handle





T Handle





Fig. 621E

Fig. 621F

Fig. 621G

T HANDLE WITH UNION

| Sizeinches | 1/8 | 1/4 | 3 % | 1/2 | 3/4 | 1 |
|------------|------|------|------|------|------|------|
| Priceeach | 1.35 | 1.60 | 1.85 | 2.35 | 2.60 | 3.10 |

LEVER HANDLE WITH UNION

| Sizeinches | 1/8 | 1/4 | 3 % | 1/2 | 3/4 | 1 |
|------------|------|-----|------|------|------|------|
| Priceeach | 1.50 | 175 | 2.00 | 2.50 | 2.75 | 3.25 |

TRACTION ENGINE CYLINDER COCKS

| | | | | . – – - | | |
|-------------------------|------|------|------|---------|------|------|
| Sizeinches | 1/8 | 14 | 3 | 1/2 | 1/2 | 3/4 |
| Size Blank Shank inches | 3 | 1/2 | 5 8 | 3/4 | 7 8 | 11/8 |
| Price, Short Shank each | | 1.30 | 1.40 | 1.85 | 2.50 | 3.25 |
| "Long " " | 1.45 | 1.55 | 1.70 | 2.20 | 3.00 | 4.00 |

STEAM GAUGE COCKS

Steam Metal

T HANDLE

FEMALE BOTH ENDS



Fig. 789A

MALE AND FEMALE



Fig. 789B

WITH UNION



Fig. 789C

FEMALE BOTH ENDS

| Sizeinches | <u>1</u> /8 | 1/4 | 3/8 | _ ⅓ |
|------------|-------------|-----|-----|------|
| Priceeach | .65 | .70 | .85 | 1.00 |

MALE AND FEMALE

| Sizeinches | 1/8 | 1/4 | 3/8 | 1/2 |
|------------|------|-----|-----|------|
| Priceeach | . 75 | .80 | .90 | 1.05 |

WITH UNION

| Sizeinches | 1/8 | 1/4 |
|-------------------------|------|------|
| Price Light Patterneach | 1.35 | 1.50 |
| " Heavy "" | 1.60 | 1.75 |

FEMALE BOTH ENDS



Fig. 789D

LEVER HANDLE MALE AND PEMALE



Fig. 789E

WITH UNION



Fig. 789F

FEMALE BOTH ENDS

| Sizeinche | 8 1/8 | 1/4 | 3/8 | 1/2 |
|-----------|-------|-----|------|------|
| Priceeac | .80 | .85 | 1.00 | 1.15 |

MALE AND FEMALE

| Sizeinches | 1/8 | 14 | 3/8 | 1/2 |
|------------|------|------|------|------|
| Priceeach | . 90 | . 95 | 1.05 | 1.20 |

WITH UNION

| Sizeinches | 1/8 | 1/4 | 3/8 |
|-------------------------|------|------|------|
| Price Light Patterneach | 1.50 | 1.65 | |
| " Heavy " " | 1.75 | 1.90 | 2.00 |

GAUGE COCKS

PLAIN



COMPRESSION



Fig. 8378B

| Fig. 8378A | PLAIN |
|------------|--------|
| 9: | inghee |

Price, Light Patterneach

| Sizeinches | 3 8 | 12 | 34 |
|---|-----|------|------|
| Price, Light Patterneach "Standard Pattern" | .95 | 1.00 | 1.25 |
| WITH STUFFING BOX | | | |
| Sizeinches | 3 8 | 1/2 | 3/4 |

Standard Pattern " COMPRESSION. REGRINDING



1.20 1.35 PITTSBURGH, ROTATING



Fig. 8378C

COMPRESSION, REGRINDING

| Size | inches | 1/4 | 3 8 | 1.2 | 34 |
|-------|--------|-----|------|------|------|
| Price | each | .90 | 1.05 | 1.30 | 1.80 |

PITTSBURGH, ROTATING

....incheseach 2.002.00

1.45

1.70

1.50

MISSISSIPPI, WITH SPRING





Size, Pipe Thread inches

" Blank Shank "

Price, Threaded or Blank Shank each $\frac{\frac{1}{2}}{\frac{3}{4}}$ 1.20 5% .90 1 1.50 1.80 with Spring 1.00 1.35 2.05 EXCELSIOR



RALL



Fig. 8378G

Fig. 8378H BALL

| Sizeinches | 3.4 | 1 2 | 34 |
|------------|-----|-----|------|
| Price each | .85 | .90 | 1.00 |
| FYCELCIOD | | | |

| | LACELSION | |
|------------------------|-----------|----------|
| | | |
| Size | inches | 1. or 34 |
| | | |
| Price, Plain | each | 4.50 |
| " with Emergency Valve | | 6.00 |
| | | |

STEAM GAUGE SYPHONS, ETC.

STEAM GAUGE SYPHONS

No. 2 No. 1

No. 4









Pig. 6835A

Fig. 6835B

Fig. 6835C

Fig. 6835D

| Number | 1 | 2 | 3 | 4 |
|---|------|---------------------|------|------|
| Price, Brass, Finished each "Nickel Plated" | 1.00 | $\frac{1.25}{1.75}$ | 1.50 | 1.50 |
| Nicket Flaved | 1.00 | 1.73 | 2.00 | 2.00 |

IRON SYPHON



Fig. 6835E

| Sizeinches | 1/4 |
|---------------------|------|
| Price, Ironeach | .25 |
| " Brass, Finished" | 1.00 |
| " " Nickel Plated " | 1.50 |

STEAM GAUGE HAND PULLER







Fig. 6835F



Fig. 6835G

STEAM GAUGE HAND PULLERS

| Number | 1, for all Gauges up to 8½ in. | 2, for all Larger Sizes |
|------------|--------------------------------|-------------------------|
| Price each | 1.50 | 3.00 |

HYDRAULIC CHECK VALVES FOR HYDRAULIC GAUGES

Priceeach | 2.50

In the general use of hydraulic gauges, the pressure is exhausted so suddenly as to cause a severe shock to the interior springs which soon weakens them; to prevent injurious effects and allow a more gradual exhausting of the pressure we recommend the ase of hydraulic check valves with every hydraulic gauge,

INDICATOR COCKS AND CORNER FITTINGS

STRAIGHTWAY INDICATOR COCK





Pig. 812A



Fig. 812B

| Size inches | 1/2 | 3/4 |
|---|-------|--------------|
| Price, Straightway, Finished each " Nickel Plated " | 4.00 | 6.00 7.50 |
| " Three-Way, Finished " Nickel Plated " | 10.00 | 15.00 |
| " Nickel Plated" | 12.00 | 18.00 |

CORNER ELL



Fig. 812C

CORNER VALVE



Fig. 812D

| Size | | inches | 1/2 | 3⁄4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|----------|-------------|---|------|------|------|------|------|------|-------|------|
| Price, | Corner " | Ell, Finished each "Nickel Plated " Valve, Finished " | 2.90 | 3.20 | 3.60 | 4.10 | 4.60 | 5.40 | | 9.40 |
| <u> </u> | " | | | | | | | | 10.20 | |

COMPLETE INDICATOR ATTACHMENT WITH RELIEF AND CORNER VALVES



Fig. 812E

| Sizeinches | 1/2 | 3⁄4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------------------|
| Finished, with Relief Valves. " | 25.60 32.00 | 26.40 34.00 | 28.00 37.00 | 29.00 40.00 | 32.00 45.00 | 40.00 60.00 | 47.00 84.00 | 50.00 58.00 100.00 110.00 |

BRASS STEAM COCKS AND WRENCHES

SQUARE HEAD

STANDARD

FLAT HEAD

THREE WAY WITH CHECK







Fig. 757A

SQUARE AND FLAT HEAD

Sizeinches 14 38 12 34 1 114 112 2 212 3

Fig. 7570

| | 1.4 | / 0 | 1 4 | / 'E | | / TE | 1 44 | | 1 44 | | 7 60 | |
|--|-------|------|------|------|------|------|------|---|------|-------|-------|-------------|
| Priceeach "with Check" | | | | | | | | | | | | |
| *Made to order only, | | | | | | o-w | тн | CHE | ск | | | |
| Size | in | ches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
| Price | | each | 1.80 | 2.10 | 2.50 | 3.00 | | 5.75 | 7.15 | 11.00 | 18.75 | 26.00 |
| | | | TEE | HA | NDL | E | | | | | | |
| Size | | | | | in | ches | 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 |
| Price | | | | | | | | .85 1.00 | | | | |
| , F | LAT | HEA | D-I | MALE | AN | DF | EMA | LE | | | | |
| Size | | | in | ches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
| Price | | | | each | 1.35 | 1.45 | 2.00 | 2.50 | 3.00 | 5.35 | 6.75 | 9.85 |
| SPI | ECIA | LS | QUA | REA | ND | FLA | THE | AD | | | | |
| Size | | | in | ches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
| Price | | | | each | 1.25 | 1.70 | 2.35 | 3.70 | 4.85 | 7.30 | 14.50 | 22.50 |
| EXTRA HEAVY SQUA | RE | HEA | D-F | OR 2 | 50 P | OUN | DSV | VOR | KING | PR | ESS | URE |
| Size | | in | ches | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
| Price | | | each | 1.75 | 1.75 | 2.40 | | 6.00 | 7.75 | 11.50 | 23.00 | 35.00 |
| . FLA | NGE | ED-S | SQUA | ARE | OR | FLAT | HE | AD | | | | |
| Sizeinche | S 3/4 | 1 | 11 | 1 11 | 2 2 | 2 21 | 2 3 | 31 | 2 4 | | 5 | 6 |
| Price each Diameter of Flanges, inche | | | | | | | | $\begin{array}{c c} 00 & 62. \\ 2 & 81 \end{array}$ | | | | 75.00 11 |
| | | | | | | | | | | | | |

These cocks are made to order only.

MALLEABLE IRON WRENCHES

SQUARE HEAD

FLAT HEAD





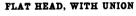
SQUARE HEAD

| Number | | | | | | | | | | | | |
|-------------------------|------------|------------|-----|-----|-----|------------|-----------------------|----------|-----------|----------|------------|-----------|
| Sizeinches Priceeach | $.05^{-1}$ | 3/8 .06 | .07 | .09 | .14 | 114 .19 | $\frac{11/_{2}}{.25}$ | 2 .44 | 2½ .56 | 3 .56 | 3½ 1.00 | 4 1.00 |
| FLAT HEAD | | | | | | | | | | | | |

| | | | | , | | | |
|------------------------|----------|-------|-------|--------|--------|------|-------|
| Manus Lau | 1 1 | | 1 0 | | | _ | |
| Number | 1 1 | 1 2 | 1 .3 | 1 3 | l b | 7 | 1 X |
| | | | | | | | |
| 0: | 1 1 / | 0 / | | 111 | 417 | | A |
| Size inches Price each | 1 1/6 | 3/4 | | 1 11/2 | 1 11/2 | ' '' | ひしくべ |
| | / 2 | /4 | _ | -/4 | -/2 | - | ~72~ |
| Price | 07 | OO. | 1 1 4 | 1 95 | 44 | 50 | 1170 |
| 1 11CC | 101 | טט. ו | .14 | | .44 | .00 | LL.UU |
| | <u>'</u> | | | 1 | | | |

BRASS GAS METER COCKS

PLAT HEAD



FLAT HEAD, LOCK









FIg. 756A

Fig. 756B

Fig. 756C

FLAT HEAD

| Sizeinches | 1/2 | 3⁄4 | 1 | 11/4 | 11/2 | 2 |
|------------|------|------|------|------|------|------|
| Priceeach | 1.30 | 1.40 | 1.95 | 3.00 | 4.25 | 6.00 |

FLAT HEAD, WITH UNION

| Size | inches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|-------|--------|------|------|------|------|------|------|
| Price | each | 1.40 | 1.55 | 2.20 | 3.40 | 5.00 | 7.00 |

FLAT HEAD, LOCK

| Sizeinches | 1/2 | 34 | 1 | 134 | 11/2 | 2 |
|------------|------|------|------|------|------|------|
| Price each | 1.40 | 1.75 | 2.30 | 3.85 | 5.50 | 7.75 |

FLAT HEAD, WITH UNION AND LOCK

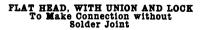








Fig. 756D

Fig. 756E

FLAT HEAD, WITH UNION AND LOCK

| Size | inches | 1/2 | 34 | 1 | 114 | 11/2 | 2 |
|-------|--------|------|------|------|------|-------------|------|
| Price | each | 1.50 | 1.80 | 2.50 | 4.00 | 5.50^{-1} | 8.00 |

FLAT HEAD, WITH UNION AND LOCK, SPECIAL CONNECTION

| Sizeinc | hes | 1/2 | 3/4 | 1 | 11/4 | 11/2 2 | _ |
|---------|-----|------|------|------|------|------------|----|
| Pricee | ach | 1.50 | 1.80 | 2.50 | 4.00 | 5.50 + 8.0 | 00 |

IRON COCKS

FOR 125 POUNDS WORKING PRESSURE STANDARD THREE-WAY

SOUARE HEAD







A Fig. 758B

| S | ГΑ | N | D | A | R | D |
|---|----|---|---|---|---|---|
|---|----|---|---|---|---|---|

| Sizeinches | | | | | | | | | | | 5 | 6 | 8 |
|--------------------|-----|------|------|------|------|-------------------|------|------|--------------------|-------|-------|-------|--------|
| Price, Screwedeach | .90 | 1.05 | 1.30 | 1.60 | 1.95 | $\overline{2.70}$ | 4.40 | 6.75 | $\overline{12.00}$ | 15.50 | 32.00 | 45.00 | 100,00 |
| " Flanged " | | | 2.25 | 2.75 | 3.25 | 4.25 | 6.25 | 9.50 | 15.00 | 19.00 | 36.00 | 50.00 | 107.00 |

STANDARD WITH BRASS WASHER

| Size inches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 8 |
|--------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|--------|
| Price, Screwedeach | 1.00 | 1.20 | 1.55 | 1.95 | 2.35 | 3.20 | 5.15 | 7.75 | 14.00 | 19.00 | 38.00 | 53.00 | 110.00 |
| " Flanged " | | | 2.50 | 3.10 | 3.65 | 4.75 | 7.00 | 10.50 | 17.00 | 22.50 | 42.00 | 58.00 | 117.00 |

STANDARD WITH BRASS PLUG

| Sizeinches | | | | | | | | | | 5 | 6 | 8 |
|---------------------|-----------------|------|------|------|------|-------|-------|-------|-------|-------|--------|--------|
| Price, Screwed each | | | | | | | | | | | | |
| " Flanged " | . . | 3.00 | 3.75 | 5.00 | 7.00 | 10.50 | 15.75 | 30.00 | 40.00 | 70.00 | 100.00 | 210.00 |

Flat head $\frac{1}{2}$ to 2 inch, and square head, $2\frac{1}{2}$ to 8-inch, will always be furnished, unless otherwise ordered.

These cocks will be furnished with check when so ordered, at a special price.

DIMENSIONS OF FLANGED IRON COCKS

| Sizeinches | | | | | | | | _ | 5 | 6 | 8 |
|--|---|------------|----------------|------|----------------|----------------|------|------|------|------|----------|
| Diameter of Flangesinches Bolt Circle " | 4 | 41/2 | 5 | 6 | 7 | $7\frac{1}{2}$ | 81/2 | 9 | 10 | 11 | $131{2}$ |
| Bolt Circle " | 3 | 33 ± 3 | $3\frac{7}{8}$ | 43/4 | $5\frac{1}{2}$ | 6 | 7 | 71/2 | 81/2 | 91/2 | 1134 |

SPECIAL EXTRA HEAVY-FOR 200 POUNDS WORKING PRESSURE With Cast Iron Plug, Nut and Washer

| Size inches | | | | | | | | | 4 |
|-----------------------|------|------|------|------|------|------|-------|-------|-------|
| Price, All Ironeach | 1.15 | 1.25 | 1.75 | 2.10 | 2.80 | 3.65 | 6.50 | 9.00 | 22.50 |
| " With Brass Washer " | | | | | | | | | |
| " " " Plug " | 1.70 | 2.25 | 2.80 | 3.85 | 5.60 | 7.00 | 13.25 | 19.00 | 56.00 |

SPECIAL EXTRA HEAVY-FOR 200 POUNDS WORKING PRESSURE With Malleable Iron Plug, Nut and Washer

| Sizeinches | 1 | 1!4 | 11/2 | 2 | 2^{1} | 3 | 4 |
|------------|------|------|------|------|---------|-------|-------|
| Priceeach | 2.50 | 3.00 | 4.00 | 5.00 | 10.00 | 13.00 | 31.00 |

THREE-WAY SCREWED

| Sizeinches | | | | | | | | | | | 6 |
|-----------------------|------|------|------|------|------|------|-------|-------|-------|-------|--------|
| Price All Ironeach | 1.65 | 1.80 | 2.05 | 2.65 | 3.65 | 5,35 | 7.50 | 14.00 | 19.00 | 36.50 | 52 00 |
| " With Brass Washer " | 1.80 | 2.05 | 2.40 | 3.05 | 4.15 | 6.10 | 8.50 | 16.00 | 22.50 | 42.50 | 60,00 |
| " " " Plug " | 2.20 | 2.40 | 3.10 | 4.50 | 6.25 | 9.75 | 13.75 | 30.00 | 40.00 | 71.50 | 100.00 |

These cocks will be furnished with check when so ordered, at a special price. Flanged Three-way Cocks will be furnished to order. Prices on application.

BLOW-OFF VALVES



ASBESTOS DISC BRASS

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|--------------------|------|------|------|-------|-------|-------|-------|-------|
| Price, Screwedeach | 2.00 | 3.00 | 4.00 | 5.00 | 6.00 | 8.50 | 18.00 | 25.00 |
| " Flanged " | | | 8.65 | 10.75 | 13.00 | 19.50 | 28.00 | 36,75 |

JENKINS BROS. BRASS Size....inches 1 114 11/6 21/6 Price. Screwed.....each 2.00 3.00 4.00 5.00 6.50 9.25 18.00 25.00 Flanged..... " 9.00 | 11.00 | 13.00 | 20.00 | 28.00 | 37.00

| BASHLI | N "Y | " BR | ASS | ' | | <u></u> | |
|------------|------|------|-----|------|------|---------|------|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 |

Price, Brass, Screwedeach | 2.50 | 4.00 | 5.00 | 6.50 | 8.50 | 16.00 | 24.00



Pig. 4844D

BRASS REGRINDING

| Sizeinches | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 |
|------------|------|------|------|------|------|-------|
| Price each | 2.75 | 3.25 | 4.00 | 5.75 | 9.00 | 18.50 |

These valves are furnished with Male or Male and Female Ends when so ordered at prices given above.

BLOW-OFF VALVES

EVERLASTING

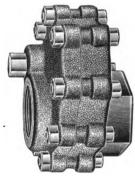
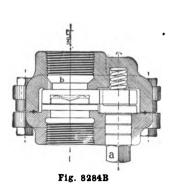


Fig. 8284A

| Sizeinches | 1 | 11/2 + 2 | + 21/2 | 3 | 4 | 5 |
|------------------------------|-------|--------------|-----------|-------|--------|--------|
| Price, Iron Body Screwedeach | 15.00 | 20.00 25.0 | 0 30.00 | 45.00 | 60.00 | 80.00 |
| " " " Flanged " | 18.00 | 24.00 29.0 | 0 35.00 | 48.00 | 70.00 | 90.00 |
| " Semi-Brass Screwed " | 20.00 | 30.00 40.0 | 0 50.00 | 64.00 | 80.00 | 100.00 |
| " " Flanged " | 24.00 | 35.00 45.0 | 0 55.00 | 70.00 | 90.00 | 110.00 |
| | | 40.00 55.0 | | | | |
| " " " Flanged" | 35.00 | 46.00 62.0 | 0 79.00 | 90.00 | 115.00 | 134.00 |

SECTIONAL VIEW



TOP VIEW

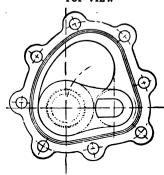


Fig. 8284C

A wrench is placed upon the square head at "A" and pushed down, opening the Valve, and reversed to close it; the effort to open it in the 2-inch size being about 25 pounds on an 8-inch lever against 200 pounds steam pressure, about one-fifth that necessary to operate most plug cocks.

necessary to operate most plug cocks.

It will be further noticed that the inlet orifice is tapered just above the seat at "B"; this increases the velocity of the "blast" at this point and insures its delivery into the discharge pipe without punishment to the seat, as would be the case were this precaution not taken. It also has the effect of "syphoning" the valve clean at each operation.

A glance at the cut will show how easily the working part of the Valve may be renewed and refaced—a monkey wrench and file being the only tools needed. This feature is made possible, however, by the simplicity of the whole apparatus.

LUNKENHEIMER DURO BLOW-OFF VALVES

WITH SELF-CLEANSING SEAT

For Working Pressures up to 250 Pounds SCREWED



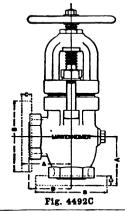


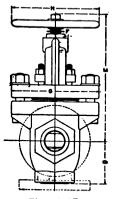


| _ | | | | |
|----|----|----|-----|----|
| Fi | g. | 44 | 92/ | ١. |

| Sizeinches | 11/4 | 1½ | 2 | 21/2 | 3 |
|---|--------------|----------------|------------------|------------------|------------------|
| Price, Screwed each " and Flanged " " Flanged " | 7.50 8.10 | 10.00 10.80 | $13.50 \\ 14.40$ | $18.20 \\ 19.20$ | $27.50 \\ 28.60$ |
| " Flanged " | 8.70 | 11.20 | 15.00 | 20.00 | 30.00 |

GENERAL DIMENSIONS



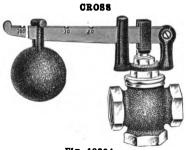


| Fig. | 4492 | ľ |
|------|------|---|
|------|------|---|

| Sizeinches | 114 | 11/2 | 2 | 21/2 | 3 |
|--|-----------------|-------|--------|----------------------------|--------------------------|
| A -Center to Face of Inlet or Outlet, Flanged Ends. inches | 4 | 4 76 | 45/8 | 514 | 53/4 |
| B - Diameter of Flanges. " C - Thickness " " " | 13.4 | 676 | 1 61/2 | 71/2 | 81/4 |
| D-Center to Face of Inlet or Outlet, Screwed Ends " | 33/8 | 334 | 41/8 | 43/4 | $\frac{1}{5}\frac{7}{8}$ |
| E - " of Port to Top of Stem, when open " E - " " " " " " closed " | 1214 | 135/8 | 151/8 | | |
| E = " " " Closed " F - Diameter of Stem " | 101/2 | ÷ 2 | 123/4 | $\frac{14}{1\frac{3}{32}}$ | 151/2 |
| G-Length of Body and Yoke Flanges " | $6\frac{35}{2}$ | 714 | 77/8 | 91/8 | $10\frac{1}{8}$ |
| H-Diameter of Hand Wheel " | 6 | 7 | 8 | 9 | 10 |

21/2

SAFETY VALVES



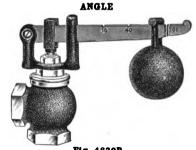


Fig. 4830A

F1g. 4830B

BRASS CROSS AND ANGLE SAFETY VALVES-Brass Disc

| Price, Crosseach 2.20 2.50 3.25 3.90 4.70 7.15 9.00 12.50 22.50 33.50 "Angle" 3.25 3.90 4.70 7.15 9.00 12.50 22.50 33.50 3.25 3.90 4.70 7.15 9.00 12.50 33.50 | Price, Crosseach 2 | 2.20 2 | 2.50 | $\frac{3.25}{3.25}$ | 3.90 3.90 | 4.70 | 7.15 7.15 | 9.00 9.00 | $ 12.50 \ 12.50 $ | 22.50 | 33.50 |
|---|----------------------|----------|------|---------------------|--------------|------|--------------|--------------|---------------------|-------|-------|
|---|----------------------|----------|------|---------------------|--------------|------|--------------|--------------|---------------------|-------|-------|

| Sizeinches | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 |
|--|-------|-------|-------|-------|--------|-----------|
| Price, Screwedeach | 5.00 | 5,80 | 7.80 | 13.25 | 17.25 | 23.00 |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 |
| Price, Screwedeach | 28.75 | 34.50 | 41.50 | 57.75 | 93.50 | 132.00 |
| " Flanged " | 34.00 | | 48.00 | 65.00 | 100.00 | 140.00 |
| Diameter of Flangesinches Face to Face | 9 | ١ | 10 | 11 | 121/2 | 131/2 |
| Face to Face " | 11 | | 13 | 14 | 16 | 13½ 17 |

BRASS CROSS SAFETY VALVES - Jenkins Disc

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|-------------------------|------|------|------|------|-------|-------|
| Price, Cross Valveeach | 4.00 | 5.00 | 6.00 | 9.00 | 11.00 | 16.00 |
| " with Balance Weight " | 4.25 | 5.30 | 6.50 | 9.60 | 11.60 | 16.60 |

IRON BODY CROSS AND ANGLE SAFETY VALVES-Jenkins Disc

| Price, Screwedeach "Flanged" Diameter of Flangesinches | | | | | | |
|--|-----------------------|----------------|----------------|----------------|----------------|-------|
| Diameter of Flangesinches | 31/2 | 4 | 4/2 | D | 6 | 1 |
| Sizeinches | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
| Price, Screwedeach "Flanged" | $\frac{22.00}{25.50}$ | 31.00 34.00 | 38.00 42.00 | 47.00 52.00 | 55.00 62.00 | 73.00 |
| Diameter of Flangesinches | 71/2 | 81/2 | 9 | 91/4 | 10 | 11 |



LOW PRESSURE SAFETY VALVES

Ball Weighted for 8 to 10 Pounds Pressure

| Sizeinches | 34 | 1 | 11/4 |
|------------|------|------|------|
| Priceeach | 2.60 | 3.30 | 4.50 |
| Sizeinches | 11/2 | 2 | |
| Priceeach | 6.35 | 8,65 | |

Fig. 48300

11/4

11/2

AMERICAN BRASS POP SAFETY VALVES

REGULAR, TOP OUTLET REGULAR, SIDE OUTLET LOCK-UP, TOP OUTLET







Fig. 7549A

Fig. 7549B

Fig. 7549C

When ordering, state pressure at which valves are to be set to blow-off; also whether top or side outlet valves are wanted. For working pressures up to 250 pounds.

| • | | | | | | |
|----------------------------------|------|---------------------|------------------|----------------------|----------------------|----------------------|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
| Priceeach For Boilershorse power | | 10.00 3 to 6 | 12.00 3 to 10 | 15.00 10 to 20 | 20.00 20 to 30 | 30.00 30 to 40 |
| Sizeinches | 21/2 | 3 | 31/2 | 4 | 5 | 6 |
| Priceeach For Boilershorse power | | 100.00 75 to 100 | | 160,00 125 to 150 | 240,00 150 to 175 | 350.00 175 to 200 |

Side outlet and lock-up valves take same lists as regular valves.

HOUSE HEATER VALVE With Top Lever LOCOMOTIVE MUFFLED TIP TOP ADJUSTMENT





Fig. 7549D Fig. 7549E HOUSE HEATER POP SAFETY VALVES

| Sizeinches | 1/2 | 3⁄4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|
| Priceeach | 10.00 | 10.00 | 12.00 | 15.00 | 20.00 | 30.00 | 50.00 | 65.00 | 100.00 | 160.00 |

Furnished for pressure not exceeding 30 pounds. Drop lever furnished at same price as top lever.

LOCOMOTIVE MUFFLED POP SAFETY VALVES

| Size | inches | 2 | 21/4 | 21/2 | 3 | 31/2 | 4 |
|----------|--------|-------|-------|----------------|----------------|----------------|--------|
| Price | each | 65.00 | 75.00 | 80.00 | 90.00 | 120.00 | 170,00 |
| Height | | | 11 | 111/2 | 12% | 14 | 151/8 |
| Diameter | | 41/2 | 5 | $5\frac{1}{4}$ | $5\frac{3}{4}$ | $6\frac{1}{2}$ | 7/4 |

AMERICAN IRON BODY POP SAFETY VALVES

With American Blow Down Ring

FOR STATIONARY AND MARINE BOILERS

"SPECIAL" EXTRA HEAVY
For Horizontal, Vertical or Water Tube Boilers





Fig. 4796A

Fig. 4796B

FOR STATIONARY OR MARINE BOILERS-Screwed or Flanged

| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 51/2 | 6 |
|--------------------------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Price, Bronze Seateach | 45.00 | 55,00 | 65.00 | 85.00 | 100.00 | 125.00 | 150.00 | 180.00 | 225.00 |
| | | | | | | | | | 255.00 |
| For Boilershorse power | 30 to | 40 to | 75 to | 100 to | 125 to | 150 to | 175 to | 200 to | 225 & |
| - | 40 | 75 | 100 | 125 | 150 | 175 | 200 | 225 | up |
| Diam. Inlet Flangeinches | 6 | 8 | 10 | 10 | 11 | 11 | 11 | 12 | 12 |

These Valves are furnished with flat seats for Stationary Boilers and beveled seats at an angle of 45 degrees for Marine Boilers. They will be furnished with Solid Nickel Seats and Lock-Up Attachment at a slight additional cost.

"SPECIAL" EXTRA HEAVY-8crewed or Flanged

| Sizeinches | 2 | 21/2 | 3 | 31 2 | 4 | 41/2 | 5 | 51/2 | 6 |
|--|---------|---------|-------|--------|--------|-----------|--------|-----------|----------|
| Price, Bronze Seateach For Boilershorse power | | 40 to | 75 to | 100 to | 125 to | 150 to | 175 to | 200 to | |
| Diameter of Flanges, inches | 40 6 | 75 8 | 100 | | | 175 11 | | 225 12 | up 12 |

These Valves are designed for working pressure up to 300 pounds and are tested to a pressure of 450 pounds.

They are especially adapted for all styles of Horizontal and Vertical Tubular Boilers as well as all Sectional and Water Tube Boilers.

Furnished with Drop Lever when so specified.



AMERICAN BRASS CYLINDER RELIEF AND SNIFTING VALVES

For Steam, Water and Air



Top Lever

FINISHED BODY Indicator Connection



Regular





Pig. 4809A

Fig. 4809B

Fig. 4809C

ROUGH BODY, REGULAR OR TOP LEVER-Screwed

| Size inches | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-----------------------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Price, Rough Bodyeach | 10.00 | 12.00 | 15.00 | 20.00 | 30.00 | 50.00 | 90.00 | 110.00 | 160.00 |
| " Finished " " | 12.00 | 15.00 | 18.50 | 25.00 | 36.50 | 58.50 | 110.00 | 130.00 | 190.00 |
| " Nickel Plated " | 13.50 | 17.00 | 21.00 | 28.00 | 40.00 | 63.50 | 124.00 | 140.00 | 210.00 |

FINISHED BODY, INDICATOR CONNECTION—Screwed

| Size inches | 3/4 | 1 | 114 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 |
|-----------------------|-------|-------|-------|-------|-------|----------------|--------|--------|--------|
| Price, Rough Bodyeach | 11.00 | 13.00 | 16.50 | 22.50 | 34.00 | 55.00 | 102.00 | 124.00 | 176.00 |
| " Finished " | 14.00 | 17.00 | 21.50 | 28.50 | 42.00 | 65.00 | 124.00 | 160.00 | 210.00 |
| " Nickel Plated " | 15.50 | 19.00 | 24.00 | 31.50 | 46.00 | 70.50 | 130.00 | 168.00 | 232.00 |



Fig. 4809D

CYLINDER RELIEF VALVES-Flanged

Cylinder Relief and Snifting Valves are used on the ends of cylinders of steam engines, removing all danger of blowing out cylinder heads. These valves will be furnished with hand wheel for adjusting pressure, when so ordered.

The illustration opposite shows a valve with flanged base and side connections.

Prices on application.

AMERICAN

HYDRAULIC RELIEF VALVES





Fig. 9711B

BRONZE

These Valves are made of a special metal of great tensile strength and may be taken apart for cleaning without breaking either outlet or inlet connections. Springs are of highest grade steel and special care is used in testing. Always state pressure in inquiries or orders.

| Sizeinches | 34 | 1 | 11. | 11/2 | 9 |
|------------|-------|-------|-------|-------|-------|
| Transfer | | l _ * | | | |
| Priceeach | 13.00 | 16.00 | 21.00 | 29.00 | 45.00 |
| | | | | -0.00 | |

IRON

Furnished either with Cast Iron Body or Cast Steel, Bronze Mounted.

Valves may be taken apart for cleaning without breaking either connection.

Springs are of the highest grade special steel and tempered and tested with the greatest care and skill:

These Valves are spring-loaded, relieve automatically, and are used extensively on hydraulic pumps or wherever a heavy hydraulic pressure is required.

Constructed with either flanged or screwed connections.

Sizes and prices furnished upon application.

WATER RELIEF VALVES

BRASS AND IRON BODY

Will Set at any Pressure Specified up to 250 Pounds

BRASS No. 1126 Water or Cylinder Relief
Male Base Pemale Base









Fig. 784C

Pig. 784B BRASS No. 1126

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|---------------------|-------|-------|--------|--------|--------|-------|
| Price, Finishedeach | 10.00 | 10.00 | 12.50 | 15.50 | 19.00 | 28.00 |
| " Nickel Plated " | 11.50 | 11.50 | 14.50 | 18.00 | 22.00 | 32.00 |
| Sizeinches | *21/4 | 21/2 | 3 | 31/2 | 4 | |
| Price, Finishedeach | 40.00 | 52.00 | 90.00 | 125.00 | 150.00 | |
| " Nickel Plated " | 45.00 | 58.00 | 100.00 | 135.00 | 165.00 | |

*The 21/4-inch valve has regular 21/2 inch base thread.

Brass Relief Valves will be furnished with male base up to and including 21/2 inch; and with female base sizes 3 to 4 inches, inclusive. When required otherwise or flanged, they will be furnished at a special price.

Especially adapted for pumps, stand pipes, pipe lines, cylinders, etc.

IRON BODY No. 1123

| Size Inches | Diameter of Base Flange Inches | Center of Out- let to Bottom of Base Flange Inches | oť | Center of Valve to End of Outlet Inches | Total Height Inches | Price with Brass Seat Inches |
|----------------|---|---|----|---|---------------------------|------------------------------------|
| *21/2 | 71/2 | 51/4 | | 37/8 1 tell 0 1 tell | 17% | 45.00 |
| *3 | 81/4 | 534 | | 414 0 | 187/8 | 60.00 75.00 |
| *4 | 10 | 63/6 611/6 | :: | 5 page 5 | $\frac{20\%}{21}$ | 90.00 |
| *41/2 | 10½ | 71/8 | | | $22\frac{1}{2}$ | 110.00 |
| 5 | 11 | 73/8 | 10 | 75/6 (5 | $23\frac{1}{8}$ | 125.00 |
| 6 | 121/2 | 81/2 | 11 | 81/8 (= | $25\frac{7}{8}$ | 175.00 |

*These sizes made with screwed outlet unless otherwise specified.

To adjust for different pressures, loosen lock nut, turn hand wheel or pressure screw to right to increase pressure, to left to decrease pressure, then tighten lock nut.

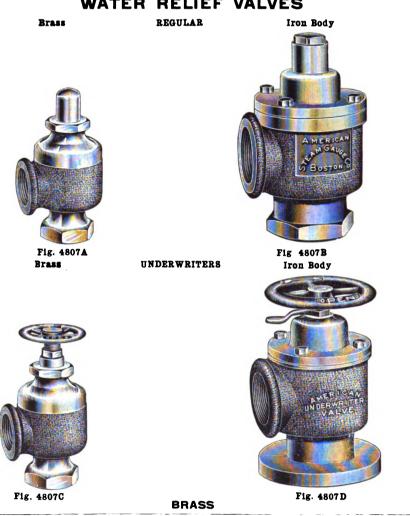
In ordering, always state highest working pressure at which Valves are to be set, and specify the style number of Valve and whether with wheel or for wrench adjustment. When not otherwise specified, will always send with wheel top.

Both the Iron and Brass Valves are suitable for pressures up to 250 pounds.

These valves are made with combination flanged and screwed base. Hexagon screwed base furnished, when so ordered, at same price.

When valves are wanted for higher pressures than 25 pounds, price will be quoted on application.

AMERICAN WATER RELIEF VALVES



| Sizeinches | 1/2 34 | $1 1_4 1_{2}$ | 2 21/2 | 3 | 312 4 |
|------------|-------------|-------------------|-------------|-------|---------------|
| Priceeach | 10.00 10.00 | 12.00 15.00 20.00 | 40.00 65.00 | 90.00 | 125.00 160.00 |

| THOR BODY | | | | | | | | | | |
|------------|-------|----------------|-------|--------|--------|--------|--------|--------|--------|---------|
| | | | | . ==== | | | ,= | | | , |
| Sizeinches | 2 | $2\frac{1}{2}$ | 3 | 312 | 4 | 5 | 6 | 8 | 10 | 12 |
| Priceeach | 45.00 | 55,00 | 65.00 | 85.00 | 100.00 | 150.00 | 225.00 | 400.00 | 800.00 | 1200.00 |

Iron Valves from 2 inches upward are made with either screwed or flanged base. If flange is desired specify when ordering.

Underwriter Valves are for either Steam, Rotary or Plunger Pumps.

PRESSURE REGULATING VALVES DAVIS PRESSURE REGULATORS







| g. 4871B | Pig. 4871C | |
|----------|------------|--|
|----------|------------|--|

| Size inches | 34 | 1 | 1114 | 11/2 | 2 | 21/2 | 3 | 31/2 |
|----------------------------------|--|---|----------------|----------------|----------------|-----------------------|----------------|------------------|
| Price, No. 1each Nos. 2 and 5 | | | 24.00 29.00 | 25.00 30.00 | 30.00 36.00 | $\frac{35.00}{42.00}$ | 40.00 48.00 | 50.00 58.00 |
| Distance End to Endinches | 31/4_ | 4 | 41/2 | 634 | 71/8 | 77/8 | 914 | 103/4 |
| Sizeinches | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 14 |
| Price, No. 1 each "Nos. 2 and 5" | 60.00 70.00 | | | | | | | 500.00 600.00 |
| Face to Face of Valvesinches | $\begin{array}{c} 10^3 4 \\ 9 \end{array}$ | | | 14 | | 181/2 | | 24¾ 21 |

34 to 1½-inch, inclusive, Screwed Ends; 2 to 6-inch inclusive, either Screwed or Flanged Ends; 7 to 14-inch, Flanged Ends.

No. 1 is designed for all purposes where there is no pulsation in the delivery pressure. No. 2 is to be used where there is a vibration or pulsation of pressure—for large Power Plants, Electric Light Stations, Etc. No. 5 is for Steamship Service.

Nos. 1 and 2 Regulators are for the reduction of pressure at a maximum of 200 pounds to any reduced pressure.

It is important when ordering Regulators to specify both the initial and delivery pressures so a valve of the proper construction will be furnished.



DAVIS P AND W REDUCING VALVES

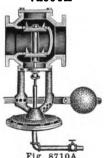
| | | | LATERITO- | way | | | |
|--------------|--------|--------|-----------|--------|--------|------------|--------|
| Size, inches | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 3½ |
| Price, each | 22.00 | 29.00 | 34.00 | 40.00 | 50.00 | 60.00 | 70.00 |
| Size, inches | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Price, each | 100.00 | 135,00 | 175.00 | 220.00 | 285.00 | ${325.00}$ | 360.00 |

| Expa | anded Ou | tlet | | |
|---------------------------------|---|---------------------|--------|--------|
| Sizeinches | 11/2×3 | 2x4 | 21/2x5 | 3x6 |
| Priceeach Face to Faceinches | $\begin{array}{c c} 50.00 \\ 714 \end{array}$ | 60.00 | 70.00 | 100.00 |
| Sizeinches | 4x8 | 5x10 | 6x12 | 8x14 |
| Priceeach Face to Faceinches | | $\frac{200.00}{15}$ | | |

1½x3 and 2x4-inch, Screwed Ends. 2½x5 and 3x6-inch, Screwed Inlet, Flanged Outlet. 4x8-inch and larger, Flanged Ends. The above Valve is for Low Pressure or Vacuum System of Steam Heating.

KIELEY REGULATING VALVES





"EUREKA" LOW PRESSURE



HIGH PRESSURE PISTON PACKED

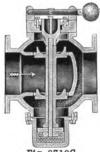


Fig. 8710C

SPECIAL "98" VACUUM

Constructed specially for all vacuum, atmospheric and very low pressure systems, such as are now being used on many buildings for heating purposes.

| Buch as are now worth, and | | | | | | | | | |
|----------------------------|---------------|--------|--------|---------------------|--------|--------|--------|--------|--------|
| Sizeinches | | | | | | | | | |
| Priceeach | 22.00 | 33.00 | 28.00 | 42.50 | 35.00 | 53.50 | 44.00 | 75.00 | 57.00 |
| Sizeinches | $2^{1}_{2}x5$ | 3x3 | 3x6 | 31x31 | 4x4 | 4x6 | 4x8 | 5x5 | 5x10 |
| Priceeach | 96.00 | 72.00 | 126.00 | 85.00 | 100.00 | 140.00 | 187.50 | 135.00 | 242.00 |
| Sizeinches | | | | | | | | | |
| Priceeach | 180.00 | 325.00 | 225.00 | $\overline{275.00}$ | 400.00 | 500.00 | 350.00 | 470.00 | |

Sizes $1x^2$ and $1x^2$ to $2x^2$ made with screw ends only, and small end of $1^1\sqrt[4]{x^2}$ to $2x^4$ made with screw ends only and large end flanged. All larger have both ends flanged.

"EUREKA" LOW PRESSURE

For reducing steam pressures from the initial or high pressure carried, which may be as high as 125 pounds per square inch, down to any pressure on the reduced side from 1 to 15 pounds.

| Sizeinches | | | | | | | | | | |
|------------|--------|------------|--------|--------|--------|----------------|--------|--------|--------|--------|
| Priceeach | 20.00 | $_{22.00}$ | 33.00 | 28.00 | 42.50 | 35.00 | 53.50 | 44.00 | 72.00 | 57.00 |
| Sizeinches | | | | | | | | | | |
| Price each | 96.00 | 72.00 | 126.00 | 85.00 | 100.00 | 140 .00 | 187.50 | 135.00 | 242.00 | 180.00 |
| Sizeinches | 6x12 | 7 | 8 | 8x14 | 8x16 | 9 | 10 | 12 | | |
| Price each | 325.00 | 225.00 | 275.00 | 400.00 | 500.00 | 350.00 | 350.00 | 470.00 | | |

Sizes $\frac{3}{4}$ to 2 and 1x2 made with screw ends only, and small end of $1\frac{1}{4}$ to $2\frac{1}{2}$ to 2x4 made with screw ends only and large end flanged. All larger have both ends flanged.

HIGH PRESSURE-PISTON PACKED

For reducing steam pressure from the initial or high pressure carried, which may be as high as 125 pounds per square inch, down to any pressure on the reduced side above 15 pounds that may be desired.

| Size | inches | 34 | 1 | 114 | 112 | 2 | 21/2 | 3 | 31/2 |
|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | each | | | | | | | | |
| Size | inches | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Price | each | 100.00 | 135.00 | 180.00 | 225.00 | 275.00 | 350.00 | 350.00 | 470.00 |

Sizes 34 to 2 inches, inclusive, made with screw ends only; all larger have flange ends. Companion flanges are always extra and only furnished with valves when so ordered. We construct to order valves for extra high initial pressures or to meet special conditions. In ordering state clearly all conditions,

PRESSURE REGULATING VALVES

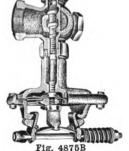
FOSTER PRESSURE REGULATORS

CLASS 'O"

CLASS "OH"

CLASS "W"





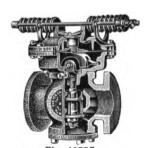


Fig. 4875C CLASS "Q"-Low Pressure

| Size inches | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 8 |
|--------------------------------|-------|-------|----------------|----------------|----------------|----------------|-----------------------|----------------|----------------|----------------|--------------------|--------|
| Price Screwed each " Flanged " | 18.50 | 20.00 | 24.00 30.00 | 28.00 33.00 | 35.00 33.00 | 40.00 43.00 | $\frac{48.00}{52.00}$ | 55.00 60.00 | 76.00 75.00 | 85.00 90.00 | $120.00 \\ 125.00$ | 200.00 |
| | | | CLAS | SS " (| э н " | -Low | Press | ure | | | | |

Sizeinches $\frac{2}{3}x1\frac{1}{2}$ 1x2 $\frac{1}{4}x2\frac{1}{2}$ $\frac{1}{2}x3$ 2x4 $\frac{2}{2}x5$ 3x6 4x85x10 6x12 Price Screwed....each 24,00 28,00 32,00 38,00 52,00 64,00 84,00 Flanged ... " 27.00|31.00| 36.00 |42.00|58.00|70.00|90.00|138.00|195.00|260.00

Class "Q" for Delivery Pressure 1 to 15 pounds for general service. Class "Q H" same as class "Q" but with enlarged outlet connection.

| | | | | CLA | SS " | w '' | | | | | |
|--|-----|--------|--------|--------|--------|-----------|--------|---------|--------|---------|-----------|
| Sizeinches | 1/2 | 2 34 | 1 | 11/4 | 1 13 | 2 2 | 21 | 2 3 | 31 | 2 4 | 41/2 |
| Price Screwed each " Flanged Diameter Flanges inches | | . 22. | 00 24. | 00 30. | 00 37. | 00 46. | 00 60. | .00 75. | | 00 105. | 00 125.00 |
| Sizeinc | hes | 5 | 6 | 7 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
| Price Screwede "Flanged Diam. Flanges inc | ** | 140.00 | 185.00 | 220.00 | 260.00 | $350\ 00$ | 450.00 | 575.00 | 700.00 | 875.00 | 1150.00 |



Pig. 4875D

Class "W" as listed are for pressures up to 125 pounds. Use "Manufacturer's Standard" dimensions for pressures above 125 pounds.

ROOT REDUCING VALVES

| Sizeinches | 1/2 | 34 | 1 |
|------------|-------|-------|-------|
| Price each | 28.00 | 30.00 | 33.00 |
| | | | |
| Sizeinches | 11/4 | 11/2 | 2 |

PRESSURE REGULATORS

No. 3



No. 4







Fig. 5188B

No. 3

| Sizeinches | 34 | 1 | 114 | 113 | 2 | 21/2 | 3 | 31/2 |
|--|----------|------|------|------|-----|---------------------|--------|------|
| Price each End to End, Screwedinches Face to Face, Flanged " | 4 | 41/8 | 414 | 434 | 634 | 50.00 734 812 | 83/4 | |
| Sizeinches | | 5 | | | | | 12 | |
| Price each End to End, Screwedinches | 91_{2} | 11 | 1215 | | | | 360.00 | |
| Face to Face, Flanged " | 101/2 | 12 | 13 | 1413 | 16 | 20 | 22 | |

No. 4

| Sizeinches | 1½ x 3 | 2 x 4 | $2\frac{1}{2} \times 5$ | 3 x 6 | 4 x 8 | 5 x 10 | 6 x 12 | 8 x 14 |
|--------------------|--------|-------|-------------------------|-------|-------|--------|--------|--------|
| Price each | | | | | | | | |
| Face to Faceinches | 7.24 | 8 | 83/4 | 10 | 12 | 15 | 171/2 | 201/2 |

Sizes $1\frac{1}{2}x3$ and 2x4, Screwed Ends. Sizes $2\frac{1}{2}x5$ and 3x6, Inlet Screwed and Outlet Flanged. Sizes 4x8 and larger, Flanged Ends.

Nos. 3 and 4 are designed for atmospheric or very low pressure and vacuum heating systems. No. 4 has an expanded outlet.

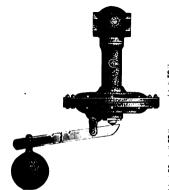


Fig. 5188C

PERFECTION

For Low Pressure Service SCREWED

| Size inches | 1 | 114 | 1½ | 2 |
|-------------|-------|-------|-------|----------|
| Priceeach | 15.00 | 17.00 | 21.00 | 27.00 |

FLANGED

| Sizeinches | $\frac{21_{2}}{2}$ | 3 | 4 | 5 |
|-------------|--------------------|--------|--------|-------|
| Price each | 39.00 | 48.00 | 69.00 | 89.00 |
| Size inches | 6 | 8 | 10 | |
| Priceeach | 120,00 | 196.00 | 300.00 | •••• |



REDUCING VALVES

MASON ALL BRONZE







Fig. 4873A

Fig. 4873B

Fig. 48730

The Mason standard reducing valve reduces and maintains even pressure of steam or air regardless of the variation of the initial pressure or of the volume of steam or air required. It automatically reduces boiler pressure for steam heating systems of all types (vacuum systems included), central heating plants, engines, paper machines, slashers, dye kettles, and all situations where it is desriable to use a lower pressure than that on the boiler.

| MASON E | BRONZE REDUC | ING | /ALVE | S Screwed | |
|---------|--------------|-----|-------|-----------|---|
| | | | | | = |
| Size | inches | 16 | 3. | 1 11/4 | |

| Size inches | | | | | | |
|------------------------------------|---------------------|---------------------|---|------------|------------|--------------|
| Length Over Unionsinches Priceeach | $\frac{534}{18.00}$ | $\frac{534}{18.00}$ | $\begin{array}{c} 7 \\ 22.00 \end{array}$ | 8 28.00 | 9 35.00 | 11½ 44.00 |
| MASON IRON BODY REDI | CINC | VALL | FS-F | langed | | |

Size inches 2½ 3 3½ 4 5 6 8 10 Diameter of Flanges inches 7½ 8½ 9 10 11 12½ 15 17½ Price each 57.00 72.00 85.00 100.00 135.00 180.00 250.00 350.00

FISHER, ANGLE PATTERN Screwed

The Fisher reducing valve regulates closely and will maintain that pressure better than any other on the market. This statement looks well on paper and we are in a position to prove it. The most trouble with reducing valves is that the low pressure increases and decreases with the fluctuation of the boiler pressure. We furnish a gauge on every valve to show the low pressure.

| Size | inches | 1/2 | 34 | 1 | 114 | $1^{1}\frac{1}{2}$ | 2 | 21/2 | 3 |
|-------------------------------|-------------|-------|-------|-------|-------|--------------------|--------|--------|--------|
| Price | each | 25.00 | 27.50 | 30.00 | 35.00 | 42.50 | 50.00 | 58.00 | 70.00 |
| FISHER, ANGLE PATTERN—Flanged | | | | | | | | | |
| Sizeinches 1 | 114 112 | 2 | 212 | 3 | 31/2 | 4 | 5 | 6 | 8 |
| Priceeach, 35.00, | 40.00 45.00 | 50.00 | 60.00 | 75.00 | 87.50 | 100.00 | 125.00 | 150.00 | 225.00 |
| FISHER, GLOBE PATTERN-Screwed | | | | | | | | | |
| Size | inches | 14 | 3/ | 1 | 114 | 113 | 2 | 91. | 3 |

| Size | | | _ | | | | | |
|------|--------|-----|-------|------|-------|------|------|--|
| | FIGUED | 010 | DE DA | TTED | N Ple | ngod | | |

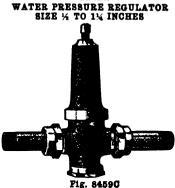
We must have the maximum and minimum high and low pressures or we cannot fill orders promptly. Do not fail to specify whether globe or angle pattern is wanted and the low pressure you desire to carry.

WATER PRESSURE REGULATORS AND

REDUCING VALVES WATSON REDUCING VALVES MUELLER DIAPHRAGM PATTERN







These valves can be made for reducing heavy water pressure, 200 lbs, or less, to any lower pressure desired on the outlet of the valve not less than 20 lbs.

They are intended especially for household use, to take the strain off of plumbing apparatus and keep the water pressure steady, thereby doing away with all hammering in the pipes and splashing of water at the spigots.

WATSON STANDARD PATTERN BRASS REDUCING VALVES-8crewed

| Sizeinche | s ½ | 34 | 1 11/4 | 11/2 | 2 21/2 |
|-------------------------|--------|---------|----------|------------------------------------|-------------|
| Priceeac | h 7.00 | 7.00 8. | 50 11.50 | $\overline{15.00}$ $\overline{25}$ | .00 45.00 |
| WATSON STANDARD PATTERN | IRON | BODY R | EDUCING | VALVES | S—Flanged |
| Sizeinches | | | | 6 | 8 |
| Priceeach | 70.00 | 90.00 | 110.00 | 150.00 | 200.00 |

Price of larger sizes on application.

WATSON DIAPHRAGM PATTERN BRASS REDUCING VALVES—Screwed

These are similar in construction to the valves shown above. They are intended for the same service, and being made with a diaphragm, will work a little more exact than the Standard Pattern valve. They are intended for particular places where water pressure is used and will regulate pressure down to between 1 and 20 pounds, and hold it without variation.

| Size | inches | 3, | 1 | 114 | 11/2 |
|-------|--------|-------|-------|-------|--------------|
| Price | each | 14.00 | 17.00 | 22.00 | 28.00 |

MUELLER WATER PRESSURE REGULATORS

The service size Mueller pressure regulator is used principally to control water pressure in the supply pipes of dwellings, hotels, public buildings, factories, etc., although it may be used with equal facility for any purpose that requires a lower or more uniform pressure than that in the street mains. In adjusting, turn the tension screw on top of the cap to the right if it is desired to increase the pressure on the outlet side, and to the left if it is desired to reduce it.

| | | - minute | | | | | |
|------------------------|-------|----------|-------|-------|-------|-------|-------|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 |
| Price, Rougheach | 7.75 | 8.00 | 11.35 | 16.45 | 28.60 | 39.20 | 77.60 |
| " " Nickel Plated " | 8.45 | 8.70 | 12.25 | 17.60 | | | |
| " Finished " | 10.00 | 10.25 | 13.85 | 19.25 | | | |
| " and Nickel Plated. " | 11.15 | 11.40 | 14.95 | 20.40 | ١ | | |

When regulators are sent out they are not adjusted for any certain pressure, but if the normal pressure and pressure wanted are given, we will have the adjustment made.

PRESSURE REGULATING VALVES, ETC.

KIELEY REGULATING VALVE



Pig. 4216A

KIELEY STRAINER CONNECTION



Pig. 4216B

KIELEY SPECIAL 1900 PRESSURE REGULATING VALVES

Suitable for steam, water, air, gas, or other service such as a pump regulator, and on oil pumping outfits where crude oil is used for fuel.

For reducing from any initial pressure down to any pressure on the reduced side up

to 100 pounds.

Has renewable disc, easily replaced in a few minutes at little expense. Will work upside down equally as well as in the position shown. Can also be placed in a vertical pipe, if necessary. Made in either straight or angle pattern.

In ordering, be careful to state the service on which regulator is to be used, also initial pressure and what pressure is desired on the outlet or reduced side.

| Sizeinches | 3/8 and 1/9 | 3/4 | 1 | 11/4 | 11/2 |
|------------------|-------------|-------|-------|---------------|-------|
| End to Endinches | | 31/4 | 33/4 | 43 % | 43/4 |
| Priceeach | 22.00 | 24.00 | 26.00 | 30 .00 | 35.00 |

Valves with flanged ends made to order. Prices on application.

KIELEY STRAINER CONNECTIONS

These strainers are provided with a finely perforated copper basket, provided with a handle, and which can be readily removed, together with its accumulation of foreign substances, by taking out the plug at top of strainer attachment.

| Sizeinches | | | | | | | 3 |
|------------|------|------|------|------|------|------|------|
| Priceeach | 2.00 | 2.25 | 2.50 | 3.50 | 4.50 | 8.00 | 9.50 |

Made screw ends only.

Strainers with flanged ends made to order. Prices on application. Can also be furnished galvanized at extra cost, when so ordered.



Pig. 42160

LUNKENHEIMER BRASS SWING JOINTS

| G: in about | 1/4×1/4 | 3/4x3/5 | ½x½ | 2/ 2/ |
|------------------------------|--------------|--------------|---|---------------------|
| Sizeinches | | 70 0 | | 3/4 x3/4 |
| Price, Rougheach Finished | 2.30 | 2.20 2.70 | $\begin{array}{c} 2.50 \\ 3.00 \end{array}$ | $\frac{3.50}{4.00}$ |
| Sizeinches | | 11/4×11/4 | 11/2×11/2 | 2x2 |
| Price, Rough each Finished " | 5.00 5.75 | 6.50 7.25 | 9.00 10.00 | 13.00 15.00 |

REDUCING VALVES WATSON REDUCING VALVES

ATMOSPHERIC

FOR STEAM

DIAPHRAGM



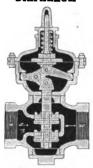


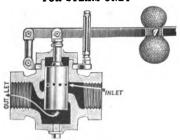
Fig. 4874A
ATMOSPHERIC REDUCING VALVES
Spec

This valve is for steam pressures from atmospheric to 5 pounds. Specially adapted to meet the requirements of the Ball, Webster, or Paul system of heating.

Size inches 1x2 114x214 114x3 2x4 214x5 3x6 4x8 5x10 6x12

| The diaphragm valve any low pressure from 20 | M IRON BOD is for reducin to 100 poundsinches | g stea | m pres | sures f | rom 20 | 00 pour | | less to |
|---|---|--------|--------|---------|--------|---------|--------|---------|
| Price | A Property Co. | | | | | | | 30.00 |
| Size | | | i | nches | 3/ | 1 | 11/4 | 11/2 |
| For use on pumps an | GM BRASS I d engines. | REDU | CING | VALV | ES-Sc | erewed | | |
| Priceeach | 20.00 26.00 | 33,00 | 45.00 | 60.00 | 80.00 | 115.00 | 150.00 | 180.00 |
| Dize | | | | | | | | |

FOR STEAM ONLY



=

LEVER AND WEIGHT

.....each 38.00 55.00 70.00 90.00 110.00 150.00 200.00

For use on heating systems or kettles, or where requiring a steady pressure on reduced side. Valves with lever and weight are for pressures up to 200 pounds, and will reduce to any pressure from 1 to 25 or 30 pounds.

| Fig. 4874 | :C | | |
|-----------|-------|----------|----------------|
| _ | BRASS | REDUCING | VALVES -8crewe |

| Price | each | $\frac{1}{2}$ | $\frac{^{3}4}{14.00}$ | $^{-1}_{17.00}$ | $\frac{1}{22}.00$ | $\frac{1\frac{1}{2}}{28.00}$ | $\frac{2}{38.00}$ |
|--------------|--------|---------------|-----------------------|-----------------|-------------------|------------------------------|-------------------|
| IRON BODY BR | | | | | | | |
| Size | inches | 2 | $2^{1}\acute{2}$ | 3 | 4 | 5 | 6 |
| Price | each | 38.00 | 55.00 | 70.00 | 90.00 | 110.00 | 150.00 |

BALANCED VALVES

MASON

WITH VALVE STEM GUIDES
ALL BRONZE IRON BODY







Fig. 4888A

Fig. 4888B

Fig. 4888C

Mason All Bronze Balanced Valves are double disc valves of extra heavy design and of the highest grade of workmanship. They are made in either the piston type or with bevel seats. The metal in the All Bronze Valves is so distributed that the expansion does not interfere with the action of the valves. Mason Iron Body Balanced Valves are constructed of cast iron with all internal working parts of bronze, the valve seats are unaffected by the difference in expansion of the two metals.

Mason Balanced Valves are used to control steam pumps, engines and the like,

Mason Balanced Valves are used to control steam pumps, engines and the like, by means of tank floats or cords to distant points, and also in connection with various devices for controlling the flow of water for receivers, open heaters, and other similar devices. They can be relied upon in any situation requiring a valve to be operated with a minimum amount of power. They are self closing by means of the weight. The

length of the lever causes them to open slowly.

MASON ALL BRONZE VALVES-8crewed

| Sizeinches | 1,2 | 3/4 | 1 | 11/4 | $1\frac{1}{2}$ | | | | |
|--------------------------------|------|------|------|------|----------------|--|--|--|--|
| Priceeach | 5.50 | 6.50 | 8.00 | 9.00 | 10,50 | | | | |
| MASON IRON BODY VALVES-Flanged | | | | | | | | | |



DAVIS BALANCED VALVE WITH LEVER Suitable for any Working Pressure up to 200 Pounds.

The Davis Balanced Valve is designed to meet all conditions requiring a perfectly balanced valve which is not affected by pressure but which is operated by some outside force in connection with the lever. The inner valve is of the double scated sliding piston type, which is the only type that can be used in a perfectly balanced valve. This inner valve is connected to the lever by a stem and voke, the stem being guided by a stuffing box. Provision is made in the post which guides the lever for limiting the throw of the valve.

| Sizeinches | | | | | | | | |
|------------|-------|-------|-------|-------|-------|-------|---------------|--------|
| Priceeach | 6.50 | 6.50 | 8.00 | 9.50 | 11.00 | 14.00 | 19.0 0 | 25.00 |
| Sizeinches | | | | | | | 10 | 12 |
| Priceeach | 30.00 | 35.00 | 45.00 | 55.00 | 65.00 | 75.00 | 90,00 | 130.00 |

Valves, 14-inch and smaller, brass. 1½ and larger, iron body. 1½ and smaller, screwed only. 2 to 6, screwed or flanged. 7 and larger, flanged only.

FLOAT VALVES







FOSTER

Fig. 2283B

Wherever a water or other liquid tank is used, it is generally desirable to maintain therein a constant level. If the tank is of large capacity, or is located at a high point, it becomes an economical necessity to hold this level with the minimum of waste.

The great variety of valves and devices commonly used to effect the desired result are all open to many serious objections—such as slowness and unreliability of operation, the necessity of employing large and cumbersome floats, and last, but by no means least, leakage. To avoid this last named objection, common in all of the ordinary devices, it is essential that the valve should be located directly over an open tank, which it is often very inconvenient, and sometimes impracticable, to do.

The Foster Float Valve overcomes all of these defects and objections. It is quick and sensitive in operation, and is actuated primarily in its movements by the fluid pressure

in the supply pipe.

It may be located at any desirable point on the supply pipe of an open tank service, and through the medium of a cord or wire be connected to a small operating float in the tank.

| Sizeinches | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 4 | 5 | 6 | 8 |
|---------------------|----------|------|------|-------|--------------|-------|-------|-------|--------|--------|-----------------------|
| Price, Screwed each | 6.50 | 8.00 | 9.50 | 12.00 | 20.00 | 40.00 | 60.00 | 88.00 | 110.00 | 150.00 | |
| " Flanged " | | ļ | ' | | | 45.00 | 65.00 | 93.00 | 115.00 | 155.00 | $\boldsymbol{200.00}$ |

The above list prices include both the angle and straight-way bodies. Sizes up to 2 inches inclusive are made of all composition; sizes $2\frac{1}{2}$ and larger have iron bodies, composition trimmed.

DAVIS

The Davis Float Valve is designed to automatically control the admission of water into a tank or reservoir by the rise and fall of the water level. The inner valve is of the double-seated piston type and is perfectly balanced. Directly connected to it by means of a stem and lever is a float which controls its movement. In a normal position this inner valve is open and allows the water to flow from the inlet pipe into the tank. When the level in the tank rises to a point of contact with the float the valve closes.

The distinctive features of this valve are its full area of the inlet pipe through the seats, giving it a large capacity, and the direct connection of the inner valve to the float which assures positive control. The small corrugated wheel at the end of the lever provides for the adjustment of the float at any desired angle. Standard valves are made for cold water at any working pressure up to 200 pounds; valves for hot water are made

to order.

| Sizeinches Priceeach | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 |
|----------------------|-------|-------|-------|-------|-------|-------|--------|--------|
| Priceeach | 9.00 | 11.00 | 12.00 | 14.00 | 16.50 | 21.50 | 29.00 | 34.00 |
| Sizeinches Priceeach | 4 | 41 2 | 5 | 6 | 7 | 8 | 10 | 12 |
| Priceeach | 39.00 | 45.00 | 49,00 | 60.00 | 70.00 | 80.00 | 100,00 | 140.00 |

Valves, 114-inch and smaller, brass. 11/2 and larger, iron body. 11/2 and smaller, screwed only. 2 to 6, screwed or flanged. 7 and larger, flanged only.

IRON BODY BACK PRESSURE VALVES

DAVIS NOISELESS BACK PRESSURE VALVES

For Non-Condensing Engines Only

SCREWED



Pig. 4886A

FLANGED



Pig. 4986B

| Sizeinches | 2 | 214 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 |
|---|---|-----|----|--------------|---------------|----------------------|----------------|----------------------|-----------------------|
| Price, Screwed each Flanged " Diam. of Flanges inches | | | | | | 30.00 30.00 9½ | | 60.00 60.00 11 | 80.00 80.00 12½ |
| Sizeinches | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| Price, Flangedeach Diam. of Flanges. inches | | | | 345.00 21 | 465.00 23½ | 600.00 25 | 750.00 2712 | 900.00 29½ | 1050.00 32 |

HORIZONTAL POSITION Cover on Top



Fig. 4886C

IN HORIZONTAL LINE Cover on Either Side





Fig. 4886D

IN OBLIQUE POSITION



Fig. 4886E



Fig. 4886F

The Davis Back Pressure Valve is a double seated piston type for non-condensing engines and vacuum or direct system of steam heating. (It should never be used on condensing engines where a high vacuum has to be maintained.) It may be placed in a horizontal position with the cover on the top, bottom or side, in a vertical position or in an oblique position. The most desirable for sensitive regulation, however, is horizontal with the cover on top.

The cover is drilled in multiple so that it may be shifted to any position. A plugged drain-hole is provided for draining the valve.

IRON BODY **BACK PRESSURE VALVES**

HORIZONTAL

STANDARD

VERTICAL.







Fig. 4887B

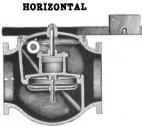
| | SCHEWED | | | | | | | | | | |
|-------|---------|-------|-------|-------|--------|--------|------|--|--|--|--|
| Size | inches | 2 | 21/2 | 3 | 31/2 | 4 | 5 | | | | |
| Price | | | | | | | | | | | |
| Size | inches | 6 | 7 | 8 | 10 | 12 | | | | | |
| Price | each | 43.00 | 70.00 | 85.00 | 120.00 | 180.00 | •••• | | | | |

SCREWED

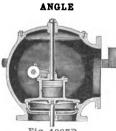
FLANGED

| Sizeinches | | | | 10 | 12 |
|-----------------------|-------|-------|-------|----|----|
| Priceeach | 47.00 | 75.00 | 90.00 | | |
| Face to Face inches | 14 | 16 | 17 | 20 | 24 |
| Diameter of Flanges " | 11 | 121/2 | 131/2 | 16 | 19 |

CRANECOMBINATION, BACK PRESSURE AND EXHAUST RELIEF VALVES For Condensing or Non-Condensing Engines







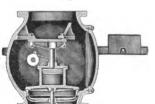


Fig. 4887E

VERTICAL

SCREWED

| Size | inches | 4 | 41/2 | l Đ | 6 | 7 | 8 | 9 | 10 + 12 |
|-------|--------|-------|-------|-------|--------|--------|--------|----------------|---------------------------|
| Price | each | 64.00 | 72.00 | 88,00 | 120.00 | 175.00 | 195.00 | $\bar{2}60.00$ | $3\overline{10.00385.00}$ |
| | | _ | | | _ | | | _ | |

FLANGED

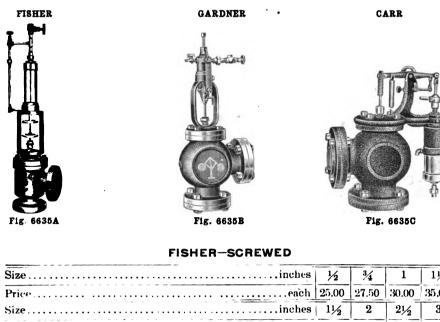
| Size | inches | 4 | 412 | 5 | 6 | 7 | 8 | 9 | 16 |
|-------|--------|--------|-------------|--------|--------|---------------------|--------|---------|----------------------|
| Price | each | 64.00 | $_{-72.00}$ | 88.00 | 120,00 | 175.00 | 195.00 | 260.00 | 310.00 |
| Size | inches | 12 | 14 | *15 | 16 | 18 | 20 | 22 | 24 |
| Price | each | 385,00 | 475.00 | 525,00 | 575,00 | $675.\overline{00}$ | 775.00 | 1050.00 | $\overline{1350.00}$ |

*The 15 inch size not made in Angle Pattern.

These valves are weighted for a maximum back pressure of 5 pounds. Sizes 16 inches and larger have double levers and weights.

When ordering state whether for use in connection with condensing or non-condensing engines.

PUMP GOVERNORS



| Sizeinches | 1/2 | 3/4 | 1 | 11/4 |
|----------------|-------|-------|-------|-------|
| Priceeach | 25.00 | 27.50 | 30.00 | 35.00 |
| Sizeinches | 11/2 | 2 | 21/2 | 3 |
| Price each | 42.50 | 50.00 | 58.00 | 70.00 |
| FISHER-FLANGED | - | | | |

| Sizeinc | hes 1 | 1/2 | 2 | $2\frac{1}{2}$ | 3 | $3\frac{1}{2}$ | 4 | 5 | 6 |
|---------|--------|-----|-------|----------------|--------------|----------------|--------|--------|--------|
| | | | | | | | | | |
| Pricee | ach 45 | .00 | 50.00 | 60.00 | 75.00 | 87.50 | 100.00 | 125.00 | 150.00 |

GARDNER-SCREWED

.....inches $\begin{vmatrix} 3/4 & 1 & 1/4 & 1/2 \end{vmatrix}$each 27.50 30.00 35.00 42.50 50.00 60.00

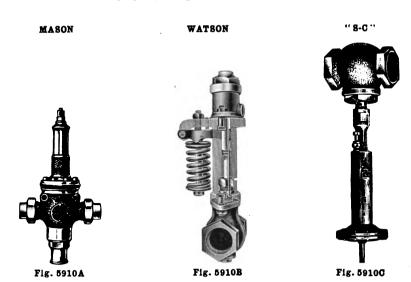
| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | |
|------------|-------|-------|-------|-------|--------|--------|--------|--------|--|
| Priceeach | 50.00 | 60.00 | 75,00 | 87.50 | 100.00 | 110.00 | 125.00 | 150.00 | |

| Sizeinches | 2 | $2\frac{1}{2}$ | 3 | 312 | 4 | 5 | 6 |
|----------------------------|-------|----------------|--------|-------|--------|--------|--------|
| Dimensionsinches Priceeach | 41/2 | 5 | 51_2 | 6 | 65% | 8 | 834 |
| Priceeach | 52.50 | 60.00 | 75.00 | 87.50 | 100.00 | 125.00 | 150.00 |

Always specify water pressure, as shipment will not be made without this information



PUMP GOVERNORS



MASON BRASS PUMP GOVERNORS SCREWED

| Sizeinch | eg 1/ | 3.4 | 1 | 11/ | 114 | 9. |
|----------|------------|-------|-------|-------|-------|-------|
| | | | | | | |
| Priceeac | ch 190 00 | 20 00 | 25 00 | 30 00 | 42.00 | 55 00 |
| I I ICO | cm 20.00 | | 20.00 | 00.00 | 12.00 | 00.00 |

MASON IRON BODY PUMP GOVERNORS FLANGED

| Sizeinches | | | | |
|------------|-------|-------|--------|--------|
| Priceeach | 68.00 | 85.00 | 100.00 | 115.00 |

Mason Governors or Regulators are self contained. They are provided with a dash pot which prevents pump from jumping.

WATSON BRASS PUMP GOVERNORS SCREWED

| Sizeinches | | | | |
|------------|-------|-------|-------|-------|
| Priceeach | 17.00 | 20.00 | 25.00 | 30.00 |

WATSON IRON BODY PUMP GOVERNORS FLANGED

| Sizeinches | | 21/2 | 3 | 4 |
|------------|-------|-------|-------|-------|
| Priceeach | 38.00 | 55.00 | 70.00 | 90.00 |

Watson Pump Governors are made both straight and angle patterns. Straight patterns furnished unless otherwise specified.

When ordering specify steam pressure and pressure desired on the discharge from the pump.

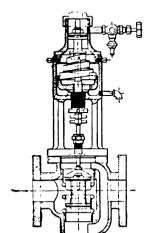
"S-C" BRASS PUMP GOVERNORS FOR BOILER FEED

| Sizeinches | 1/2 | 3⁄4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|-------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price, Screwed or Flangedeach | 25.00 | 27.00 | 30.00 | 35.00 | 42.00 | 50.00 | 60.00 | 75.00 |

The "S-C" Pump Governors are sensitive to work to one-half pound back pressure, and will maintain an even back pressure under 10 or 200 pounds steam pressure.

WATERS PUMP GOVERNORS AND COMPOUND REGULATORS

PUMP GOVERNOR



COMPOUND REGULATOR

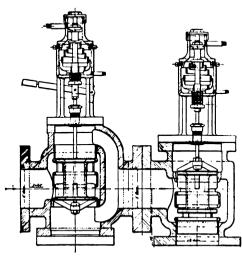


Fig. 2135A

Fig. 2135B

PUMP GOVERNORS

These machines consist of three independent parts: The valve, the pressure cylinder, and the intermediate frame containing a spring of special construction and adjusting screw. The operation is simple: The valve being controlled by the pressure which it is desired to carry, the piston is forced down and the valve closed when that pressure is exceeded. When the pressure in the cylinder is reduced, the valve is opened by the action of the spring placed in the frame. The spring tension is adjustable and the pressure can be regulated by the adjusting screw. Can be had with angle or horizontal valve chambers with screwed or flanged ends. In ordering state water pressure to be maintained.

| Sizeinches | | | | | | | | |
|------------|-------|--------|--------|--------|--------|--------|--------|--------|
| Priceeach | 20.00 | 22.00 | 25.00 | 30.00 | 42.00 | 52.00 | 65.00 | 80.00 |
| Sizeinches | 31/2 | 4 | 5 | 6 | 7 | 8 | 10 | 12 |
| Price each | 88.00 | 100.00 | 125.00 | 150.00 | 170.00 | 200.00 | 275,00 | 375.00 |

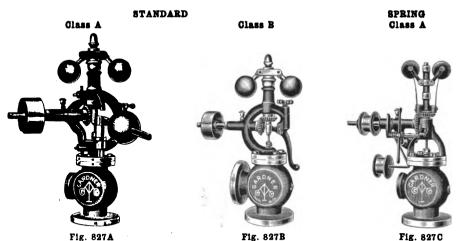
COMPOUND REGULATORS

This is a combined safety stop and pump governor. Water pressure from pump is connected by a ¼-inch pipe with both cylinders. Both valves are operated by the pressure in the cylinders, the first valve being held wide open by the pressure and the second valve operating same as the pump governor mentioned above. Should pressure be lost suddenly due to breaking of a main or any other reason, spring will instantly close first valve, stopping admission of steam to pump and thus preventing it from running away.

Prices on application.



GARDNER GOVERNORS



STANDARD GOVERNORS-Medium Speed

| Sizeinches | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/4 | 21/2 | 3 | 31/2 |
|--|----------------|-----------------|----------------|------------------|------------------|----------------|------------------|-------------------------|----------------|
| Class A, Plaineach "A, Finished" | | | 24.50 27.50 | 29.50 33.50 | 36.00 40.00 | 42.00 47.00 | 48.00 53.00 | 59.00 67.00 | 71.00 80.00 |
| " B, Plain " B, Finished " | 16.00 18.00 | 18.00 20.00 | 21.00 24.00 | 25.00 29.00 | 30.00 34.00 | 35.00 40.00 | 40.00 45.00 | 50.00 58.00 | 60.00 69.00 |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Class A, Plain e.ch " A, Finished " " B, Plain " " B, Finished " | | 107.00 83.00 | 121.00 | 154.00 122.00 | 186.00 150.00 | 185.00 | 261.00 215.00 | $\frac{290.00}{240.00}$ | 355.00 |

Class A is with Automatic Stop and Class B is without Automatic Stop. Prices on sizes 13 to 16 inches inclusive, Class A will be sent on application.

SPRING GOVERNORS—High Speed

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 1 1/2 | 2 | 21/4 | 21/2 |
|----------------------------------|-------|----------------|-------|----------------|----------------|----------------|--------|----------------|
| Class A, Plaineach "A, Finished" | | 18.50 20.50 | | 24.50 27.50 | 29.50 33.50 | 36.00 40.00 | | 48.00 53.00 |
| " B, Plain " " B, Finished " | | | | 21.00 24.00 | | 30.00 34.00 | | 40.00 45.00 |
| Sizeinches | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | •••• |
| Class A, Plaineach | 59.00 | | | 96.00 | | | | |
| " A, Finished" | 37.00 | 80.00 | 93.00 | 107.00 | 121.00 | 154.00 | 186.00 | • • • • |
| " B. Plain " | 50.00 | | | 83.00 | | | | |
| " B, Finished " | 58.00 | 69.00 | 81.00 | 94.00 | 106.00 | 138.00 | 166.00 | |

Class A is with Automatic Stop and Class B is without Automatic Stop. GARDNER HORIZONTAL SPRING GOVERNORS, for either horizontal or vertical pipe

furnished with Straight-way or Angle Valve Chambers and Flanged or Screwed openings Prices same as Spring Class B.



JUDSON GOVERNORS

CLASS A, STANDARD Medium Speed



CLASS B, STANDARD Medium Speed

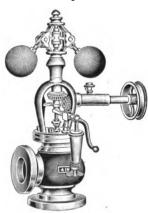


Fig. 7102A

Fig. 7102B

Judson Governors are manufactured in two styles from $3\frac{1}{2}$ to 12 inches inclusive. The standard high speed and medium speed.

The standard or medium speed governor is too well known to require any special description. The spring or high speed governor have spiral springs that are reliable and insure accurate and durable spring action.

By removing one spring the engine speed can be greatly reduced, allowing full throw of governor under all conditions of engine load. In case of accident to one spring, the governor will operate until the ring can be replaced. The spring governor is speeded on most sizes about 40 per cent faster than the standard governor.

For convenience in ordering the two kinds of governors—standard and spring—are described in two Classes, A and B, workmanship and quality the same.

| Size . | inches | 31/2 | 4 | 41/2 | 5 | 51/2 | 6 | 7 | 8 | 9 | 10 |
|--------|---------------|-------|-------|---------------|----------------|----------------|---------------|--------|----------------|----------------|--------|
| Class | A, Plaineach | 71.00 | 83.00 | 96.00 | 109.00 | 124.0 0 | 140.00 | 170.00 | 210.00 | 241.00 | 270.00 |
| 44 | A, Finished " | 80.00 | 93.00 | 107.00 | 121.0 0 | 137.00 | 154.00 | 186.00 | 227.0 0 | 261.0 0 | 290.00 |
| ** | B, Plain " | 60.00 | 71.00 | 83. 00 | 94.00 | 108.00 | 122.00 | 150.00 | 185.00 | 215.0 0 | 240.00 |
| ** | B, Finished " | 69.00 | 81.00 | 94.00 | 106.00 | 121.0 0 | 136.00 | 166.00 | 202.00 | 235.0 0 | 260.00 |

All Governors are complete with speeder, turned flanged pulley, sawyer's lever. No extras.

Standard and spring governors are described in two Classes, A and B. Workmanship and quality the same.

Class A, either standard or spring governor with automatic stop motion, spring speeder and sawyer's lever.

Class B, the same as Class A in all respects except without automatic stop motion. Parts and repairs for all sizes of the Judson Governor, from $\frac{1}{2}$ -inch up, are furnished but not assembled complete smaller than the $3\frac{1}{2}$ -inch size.

PICKERING GOVERNORS EQUIPPED WITH WIDE RANGE CHANGER



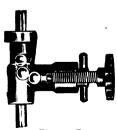


Fig. 204B

The engraving shows the simplicity of speed changing device which is furnished on Pickering Governors without additional cost.



Fig. 204C

Fig. 204A—Class B represents governor with speed changer by use of which the speed of engine can be varied while in motion. Cord attached to Sawyer's lever permits stopping engine from a distance.

Fig. 204C—Class A same as Fig. 204A with addition of automatic safety stop. The stop closes valve when belt breaks and is simple and certain in its action. When governor is to be driven by a vertical belt, order should so specify.

Pickering Class B can be changed to Class A by ordering stop motion parts. Plain governors have balls, cap and edges of flanges turned but not polished. Finished governors are the same in all respects, except parts are polished.

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/4 | 21/2 | 3 |
|-------------------------------|-----------|-------|----------------|----------------|--------|--------|--------|--------|--------|
| Class A, Plaineach | 16.50 | 18,50 | 21.00 | 24.50 | 29.50 | 36.00 | 42.00 | 48.00 | 59.00 |
| " A, Finished " | 18.50 | 20.50 | 23.00 | 27.50 | 33.50 | 40.00 | 47.00 | 53.00 | 67.00 |
| " B, Plain " | 14.00 | 16.00 | 18.00 | 21.00 | 25.00 | 30.00 | 35.00 | 40.00 | 50.00 |
| " B. Finished " | 16.00 | 18.00 | 20.00 | 24.00 | 29.00 | 34.00 | 40.00 | 45.00 | 58.00 |
| Diameter of Base Flangeinches | * | * | * | * . <i>.</i> | 53/4 | 61/2 | 7 | 71/2 | 9 |
| " " Side " " | * | * | * | * | * | * | 6 | * | 8 |
| 4" "Pulley " | 2 | 2 | $2\frac{1}{2}$ | $2\frac{1}{2}$ | 31/2 | 31/2 | 4 | 4 | 4 |
| Speed of Pulley r. p. m. | 500 | 500 | 350 | 350 | 380 | 380 | 300 | 300 | 340 |
| Sizeinches | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 |
| Class A, Plaineach | 71.00 | 83.00 | 96.00 | 109.00 | 140.00 | 170.00 | 210.00 | 241.00 | 270.00 |
| " A, Finished " | 80.00 | 93.00 | 107.00 | 121.00 | 154.00 | 186.00 | 227.00 | 261.00 | 290.00 |
| " B, Plain " | 60.00 | 71.00 | 83.00 | | 122.00 | | | | |
| " B, Finished " | 69.00 | 81.00 | 94.00 | 106.00 | 136.00 | 166.00 | 202.00 | 235.00 | 260.00 |
| Diameter of Base Flangeinches | 10 | 11 | 11 | 12 | 14 | 15 | 17 | 18 | 20 |
| " "Side " " | 81/2 | 91/2 | 10 | 11 | 13 | 14 | 15 | 16 | 18 |
| " "Pulley " | 4 | 5 | 5 | 5 | 6 | 7 | 7 | 8 | 8 |
| Speed of Pulleyr. p. m. | 340 | 320 | 320 | 275 | 275 | 275 | 260 | 260 | 225 |

^{*}Screwed.

Larger sizes and other patterns given in governor catalogue, mailed on request.

BRASS AND IRON **BODY EXPANSION JOINTS** BRASS IRON BODY





| Di | œ | 785A | |
|----|---|------|--|

Fig. 785B

Fig. 785C

| BRASS EXPAN | ISION | JOIN | NTS- | Standar | ndard Traverse | | | | |
|----------------------------|------------------|-----------------------------|---------------------|------------|---------------------|------------|------------------------------|------------------------------|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 1½ | 2 | 21/2 | 3 | |
| Traverse inches Price each | $\frac{2}{1.50}$ | $\frac{2\frac{1}{4}}{2.20}$ | $\frac{21/4}{2.75}$ | 2½ 4.00 | $\frac{21/4}{5.00}$ | 2½ 8.00 | $\frac{2\frac{1}{2}}{17.50}$ | $\frac{2\frac{3}{4}}{24.00}$ | |

| | BRASS EXPANSION JOINTS—special Havelse | | | | | | | | | | | | | |
|----------|--|---|------|------|-------|-------|-------|-------|-------|--|--|--|--|--|
| Traverse | | Sizeinches 1 | | 3/4 | 1 | 11/4 | 1½ | 2 | 21/2 | | | | | |
| 4 i | nches | Priceeach | 3.80 | 4.00 | 4.90 | 6.30 | 7.40 | 9.10 | | | | | | |
| 6 | 46 | ** ************************************ | | 8.25 | 9.00 | 10.00 | 11.50 | 13.50 | 24.00 | | | | | |
| 8 | 46 | " | | 9.00 | 10.00 | 11.25 | 13.00 | 15.50 | 27.00 | | | | | |
| 10 | 44 | " | | 9.75 | 11.00 | 12.50 | 14.50 | 17.50 | 30.00 | | | | | |
| 10 | Ec | " | | 1050 | 10.00 | 1975 | 10.00 | 10 50 | 99 00 | | | | | |

| IRO | N BO | DDY | EXP | ANS | ION | JOI | NTS | -8cre | wed, | Standa | rd Tra | verse | |
|---------------|------|------|-----|-----|------|------|-----|-------|------|--------|--------|-------|----|
| Sizeins. | 2 | 21/2 | 3 | 3½ | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Traverse ins. | 21/2 | 21/2 | 234 | 3 | 31/4 | 31/2 | 4 | 5 | 6 | 7 | 7 | 7 | 8 |

FYDANSION JOINTS-Screwed Special Traverse

| | | INON BOL | I LAFAITS | 1011 | | 1113 | | | D 002 | | 10100 | |
|-----|--------|----------|-----------|--------------|-------|-------|-------|-------|-------|--------|--------|--------|
| Tra | verse | Size | inches | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 7 | 8 |
| 6 | inches | Price | each | | | | | | | | | |
| 10 | 44 | " | " | 16.00 | 19.00 | 25.00 | 35.00 | 42.00 | 62.00 | 80.00 | 100.00 | 140.00 |
| 12 | 46 | " | " | 18.50 | 22.00 | 29.00 | 40.00 | 48.00 | 70.00 | 92.50 | 115.00 | 160.00 |
| 14 | 44 | " | | | | | | | | | 130.00 | |
| 16 | 44 | " | | | | | | | | | 145.00 | |
| 18 | 44 | " | " | 26.00 | 31.00 | 41.00 | 55.00 | 66.00 | 94.00 | 130.00 | | |

| IRON BODY EXPANSION JOINTS—Flanged, Standard Traverse | | | | | | | | | | | |
|---|--------------|---------------|---------------|--------------|--------------|---|--------------------------|--------------------------------|--|--|--|
| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | | | |
| Traverseinches | 21/2 | 21/2 | 234 | 3 | 31/4 | 31/2 | 4 | 5 | | | |
| Diameter of Flanges " Priceeach | 6 15.00 | 7 16.00 | 71/2 18.50 | 8½ 25.00 | 30.00 | 91/4 40.00 | 10 48.00 | 11 55.00 | | | |
| Sizeinches | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 | | | |
| Traverseiuches | | 7 | 7 | 7 | 8 | 10 | 10 | 10 | | | |
| Priceeach | 12½ 80.00 | 13½ 110.00 | 15 120.00 | 16 175.00 | 19 250.00 | $\begin{array}{c} 21 \\ 500.00 \end{array}$ | $22\frac{1}{4}$ 550.00 | $\frac{23\frac{1}{2}}{600.00}$ | | | |

| IRON BODY EXPANSION JOINTS—Flanged, Special Traverse | | | | | | | | | | | | | | |
|--|-------|-------|---------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| Tra | verse | Size. | .inches | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 7 | 8 | 10 | 12 |
| 6 i | nches | Price | each | 18.00 | 20.00 | 25.00 | 35.00 | 40.00 | 55.00 | 65.00 | | | | |
| 10 | 44 | 44 | " | 23.00 | 26.00 | 32.50 | 45.00 | 52.00 | 72.00 | 90.00 | 112.00 | 150.00 | 225.00 | 300.00 |
| 12 | 66 | 66 | " | 25.50 | 29.00 | 36.50 | 50.00 | 58.00 | 80.00 | 102.50 | 127.00 | 170.00 | 255.00 | 350.00 |
| 14 | 66 | 66 | . " | 28.00 | 32.00 | 40.50 | 55.00 | 64.00 | 88.00 | 115.00 | 142.00 | 190.00 | 285.00 | 400.00 |
| 16 | 44 | 44 | | | | | | | | | | 210.00 | | |
| 18 | 44 | " | | | | | | | | | | 230.00 | | |

The expansion will average about 1 inch in 50 feet of pipe.

EXTRA HEAVY IRON BODY EXPANSION JOINTS

SAFETY TIE RODS WITH BRASS SLEEVES

For 250 Pounds Working Pressure





Fig. 3816A

FLANGED, No. 49E



Fig. 3816B

STANDARD TRAVERSE - No. 48E

| Sizeinches | | | | | 4 | 5 |
|------------------------------------|-----------------|---------|--------|--------|--------|--------|
| Priceeach | 30.00 | 40.00 | 50,00 | 60.00 | 70.00 | 80.00 |
| Traverseinches | 21/2 | 21/2 | 23/4 | 3 | 314 | 4 |
| Traverse inches End to End, Open " | $15\frac{1}{8}$ | 1513/6_ | 161/8 | 18 | 187/8 | 215/8 |
| Sizeinches | 6 | 7 | 8 | 9 | 10 | 12 |
| Price each | 100.00 | 120.00 | 145.00 | 190.00 | 240.00 | 290.00 |
| Traverseinches | 5 | 6 | 7 | 7 | 7 | 8 |
| Traverseinches End to End, Open" | 247/8 | 27% | 30¾ | 313/4 | 323/4 | 361% |

STANDARD TRAVERSE - No. 49E

| Sizeinches | 2 | 212 | 3 | 31/2 | 4 | 5 | 6 | 7 |
|-----------------------|-----------------|--------------------|------------------|--------|-----------------|-----------------|--------|---------|
| Price each | 35.00 | 45.00 | 55.00 | 65.00 | 75.00 | 85.00 | 105.00 | 125.00 |
| Traverse inches | 21/2 | 21/2 | $2\frac{3}{4}$ | 3 | 31/4 | 4 | 5 | 6 |
| Face to Face, Open " | $15\frac{1}{2}$ | 16 | $175\frac{7}{8}$ | 18116 | 1912 | $223\mathrm{s}$ | 2534 | 281.4 |
| Diameter of Flanges " | $6\frac{1}{2}$ | 71_{2} | $8\frac{1}{4}$ | 9 | 10 | 11 | 121/2 | 14 |
| Bolt Circle " | 5 | $5\frac{7}{8}$ | 65 8 | 71/4 | 77/8 | 9!4 | 1058 | 117% |
| Number of Bolts | 4 | 4 | 8 | 8 - | 8 | 8 | 12 | 12 |
| Size of Boltsinches | 5 8 | _3/4 | 3 ⁵ 8 | 58 | 3/4 | 34 | 34 | 7/8 |
| Length of Bolts " | $ 2^{1} _{2}$ | 3 | 3 | 31/4 | 31/2 | 334 | 334 | 4 |
| Sizeinches | 8 | 9 | 10 | 12 | 14 | 15 | 16 | 18 |
| Price each | 150.00 | 200.00 | 250.00 | 300.00 | 500.00 | 500.00 | 750.00 | 1000.00 |
| Traverse inches | 7 | 7 | 7 | 8 | 10 | 10 | 10 | 10 |
| Face to Face " | 311/2 | 315 \$ | 335% | 371/16 | 43 | 431/8 | 45 | 461g |
| Diameter of Flanges " | 15 | 16 | 171/2 | 20 | $22\frac{1}{2}$ | 231/2 | 25 | 27 |
| Bolt Circle " | 13 | 14 | 1517 | 173/4 | 20 | 21 | 221/2 | 2416 |
| Number of Bolts | 12 | 12 | 16 | 16 | 20 · | 20 | 20 | 24 |
| Size of Boltsinches | 7/8 | 7 ∕8 | 7.8 | 7.8 | 78 | 1 | 1 | 1 |
| Length of Bolts " | 41/4 | $\frac{41_{2}}{2}$ | 434 | 5 | $ 5^{1}_{4}$ | $5\frac{1}{2}$ | 534 | 6 |

FLEXIBLE JOINTS CAST IRON

SINGLE

FOR STEAM, AIR. AND GAS No. 1 No. 2



Fig. 2129A





FOR LIQUIDS

Fig. 2129B

Fig. 2129C

| Sizeinches | 1/8 | 14 | 3/8 | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 |
|-----------------------------|----------------|----------------|----------------|------------------|------------------|----------------|----------------|----------------|-----------------|------------------|
| Nos. 1 and 3each No. 2 " | | | | | | | | | | |
| Sizeinches | 3 | 31/2 | 4 | 41/2 | 5 | 6 | *7 | *8 | *9 | *10 |
| Nos. 1 and 3each No. 2 " | 11.25 12.25 | 14.00 15.50 | 15.00 16.75 | $18.75 \\ 20.75$ | $18.75 \\ 20.75$ | 25.00 27.50 | 50.00 55.00 | 55.00 65.00 | 90.00 100.00 | 100.00 120.00 |

^{*}Screwed or Flanged. In ordering state whether steam, air or liquid is to be conveyed.

DOUBLE



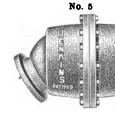


Fig. 2129D

Fig. 2129E

JENAINS

| Sizeinches | 3 N | $\begin{bmatrix} = = - \\ 1 \\ 2 \end{bmatrix}$ | 34 | 1 | $1\frac{1}{4}$. | 11/2 | 2 | 212 |
|-----------------------------|-------|---|-------|-------|------------------|-------|----------|---------------------|
| Price, Moran or Jenkinseach | | | | | | | | |
| Sizeinches | 3 | 31.2 | 4 | 5 | 6 | 8 | 10 | 12 |
| Price, Moran or Jenkinseach | 21.00 | 27.00 | 29.00 | 31.00 | 35.00 | 75.00 | 150.00 | $200.\overline{00}$ |

GAUGES

COMBINATION

Water Pressure



PYROMETER Standard Style



Fig. 1139A

Pressure and Vacuum

Fig. 1139B

Fig. 11390

| rig. | 11990 | | | B. 11990 | |
|----------|---|-----------|--|---|---|
| †3½ 4 | 1/2 ‡5 | 51/2 6 | 63/4 8 | 1/2 10 | 12 |
| 10.00 12 | .00 | 14.00 16. | 00 20 . 00 30 | $.00\overline{40.00}$ | 60.00 |
| 10.18 12 | .20 | 14.25 16. | 50 20.60 30 | .75 41.00 | 61.50 |
| 12.00 14 | .00 | 16.00 20. | 00 25.00 40 | .00 50.00 | 80.00 |
| 12.75 15 | .00 | 17.25 21. | 50 27.00 42 | .50 53 .00 | 84.00 |
| | | | | | |
| | | | | | |
| | †3½ 4 10.00 12 10.18 12 12.00 14 12.75 15 | | $\begin{array}{ c c c c c c c c }\hline +3\frac{1}{2}\frac{1}{2} & 4\frac{1}{2}\frac{1}{2} & \frac{1}{2}5 & 5\frac{1}{2}\frac{1}{2} & 6\\\hline 10.00 & 12.00 & & 14.00 & 16.\\\hline 10.18 & 12.20 & & 14.25 & 16.\\\hline 12.00 & 14.00 & & 16.00 & 20.\\\hline 12.75 & 15.00 & & 17.25 & 21.\\\hline \end{array}$ | $\begin{array}{ c c c c c c c c c }\hline +31/2 & 41/2 & \ddagger 5 & 51/2 & 6 & 63/4 & 8\\\hline 10.00 & 12.00 & & 14.00 & 16.00 & 20.00 & 30\\\hline 10.18 & 12.20 & & 14.25 & 16.50 & 20.60 & 30\\\hline 12.00 & 14.00 & & 16.00 & 20.00 & 25.00 & 40\\\hline 12.75 & 15.00 & & 17.25 & 21.50 & 27.00 & 42\\\hline & & & & & & 28.00 & 43\\\hline \end{array}$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

*Furnished with O. G. or Oct. ring. †Water Pressure Gauges not made in 3½-inch size. ‡5-inch Compound Pressure and Vacuum and Pyrometer Gauges same list as 5½-inch. 5-inch Combination Water Pressure Gauge same list as 4½-inch.

ALTITUDE Standard HYDRAULIC Up to 20000 Pounds



Fig. 1139D



Pig. 1139E

| Δ | LT | TI | 11 | n | E |
|---|----|----|----|----------------------------|---|
| _ | | | U | $\boldsymbol{\mathcal{L}}$ | ь |

| Size, | Dialinches | 41/2 | 5 | 51/2 | 6 | 63/4 | 81/2 | 10 | 12 |
|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| | , Iron Case, Brass Ring each | | | | | | | | |
| | " " N. P. " | | | | | | | | |
| 44 | Brass Case " | 14.00 | 14.00 | 16.00 | 20.00 | 25,00 | 40.00 | 50.00 | 80.00 |
| 66 | | | | 17.25 | | | | | |
| 44 | *Brass, Deep Case " | | | | | 28.00 | 43.50 | 54.00 | 85.00 |
| 66 | *Nickel Plated Deep Case " | | | | | | | | |

* Furnished with O. G. or Oct. Ring.

HYDRAULIC

| Size, | Dialinches | 41/2 | 5 | 6 | 63/4 | 81/2 |
|--------|---------------------------|-------|-------|-------|-------|-------|
| Price, | Iron Case, Brass Ringeach | 25.00 | 30.00 | 35.00 | 50,00 | 70.00 |
| 66 | " " N. P. " " | 25.50 | 30.50 | 35.50 | 50.60 | 70.75 |
| 16 | Brass Case " | 30.00 | 35.00 | 40.00 | 60.00 | 80.00 |
| 44 | | 31.00 | 36.00 | 41.50 | 62.00 | 82.50 |

For Gauges with Maximum Hand, add 5.00 to list price.

GAUGES

Steam or Pressure



LOW PRESSURE



Fig. 1141A

SINGLE SPRING

Fig. 1141B SINGLE SPRING AND VACUUM

Fig. 1141C

| Sinue Sining | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|
| Size, Dialinches | | 21/2 | 3 | 31/2 | 41/2 | 5 |
| Price, Iron Case, Brass Ringeach | | 6.00 | 6.00 | 7.00 | 8.00 | 8.00 |
| " " N. P. Ring" | | 6.15 | 6.15 | 7.18 | 8.20 | 8.20 |
| " Brass Case " | | 8.00 | 8.00 | 9.00 | 10.00 | 11.00 |
| " Nickel Plated Case " | | 8.60 | 8.60 | 9.75 | 11.00 | 12.00 |
| * *Brass, Deep Case | | | | | | |
| " *Nickel Plated Deep Case " | | | | | | |
| Size Dialinches | 51/2 | 6 | 63/4 | 81/2 | 10 | 12 |
| Price, Iron Case, Brass Ringeach | 10.00 | 13.00 | 16.00 | 22.00 | 32.00 | 50.00 |
| " " N. P. Ring" | 10.25 | 13.50 | 16.60 | 22.75 | 33.00 | 51.50 |
| " Brass Case" | 12.00 | 16.00 | 20.00 | 30.00 | 40.00 | 75.00 |
| " Nickel Plated Case " | 13.25 | 17.50 | 22.00 | 32.50 | 43.00 | 79.00 |
| " *Brass, Deep Case " | | | 23.00 | 33.50 | 44.00 | 80.00 |
| " *Nickel Plated Deep Case " | | | 25.00 | 36.00 | 47.00 | 84.00 |

LOW PRESSURE

| Size, Dialinches | 31/2 | 41/2 | 5 |
|--|------|------|------|
| Price, Iron Case, Brass Ring each " " Nickel Plated Ring " | 7.00 | 8.00 | 8.00 |
| " " " Nickel Plated Ring " | 7.18 | 8.20 | 8.20 |

DOUBLE SPRING



Fig. 1141D

AUXILIARY SPRING



Fig. 1141E

| Size, Dialinches | | 5 | 51/2 | 6 | 63/4 | 81/2 | | 12 |
|-----------------------------------|-------|----------|-------|-------|-------|-------|-------|-------|
| Price, Iron Case, Brass Ring each | 10.00 | 11.00 | 12.00 | 15.00 | 18.00 | 25.00 | 37.00 | 55.00 |
| " N.P. Ring " | 10.20 | 11.20 | 12.25 | 15.50 | 18.60 | 25.75 | 38.00 | 56.50 |
| " Brass Case" | 12.00 | 13.00 | 14.00 | 18.00 | 22.00 | 34.00 | 45,00 | 80.00 |
| " Nickel Plated Case " | 13.00 | 14.00 | 15.25 | 19.50 | 24,00 | 36.50 | 48.00 | 84.00 |
| " *Brass, Deep Case " | | | | | 25.00 | 37.50 | 49.00 | 85.00 |
| " *Bickel Plated Deep Case " | | | | | 27.00 | 40.00 | 52.00 | 89.00 |

GAUGES

AUXILIARY SPRING



Fig. 1140A

LOCOMOTIVE STEAM HEAT



Fig. 1140B

CAR HEATING



Fig. 1140C

| AUXILIANT SI | HING | | | |
|----------------------------------|-------|----------------|-------|----------|
| Size, Dialinches | 5 | $5\frac{1}{2}$ | 6 | $6^{3}4$ |
| Price, Iron Case, Brass Ringeach | 11,00 | 12.00 | 15.00 | 18.00 |
| " " N. P. Ring " | 11.20 | 12.25 | 15.50 | 18.60 |
| " Brass Case" | 13.00 | 14.00 | 18.00 | 22.00 |
| " Nightal Distud Cogo " | 11.00 | 15 95 | 19.50 | 94 00 |

STEAM AND CAR HEATING

| Size, Dialinches | 41/2 | 5 |
|----------------------------------|-------|-------|
| Price, Iron Case, Brass Ringeach | | 11.00 |
| " " N. P. Ring" | 10.20 | 11.20 |
| " Brass Case" | 12.00 | 13.00 |
| " Nickel Plated Case" | 13.00 | 14.00 |

DUPLEX AIR BRAKE



Fig. 1140D

TRACTION ENGINE



Fig. 1140E

AMMONIA



Fig. 11401

DUPLEX AIR BRAKE

| Size, Dial inches | 5 |
|----------------------|-------|
| Price, Iron Caseeach | 16.00 |
| " Brass Case" | 20.00 |

TRACTION ENGINE

| Size, Dial | inches | 412 | 5 |
|------------------------------|--------|-------|-------|
| Price, Iron Case, Brass Ring | each | 10.00 | 11.00 |
| " " N. P. Ring | | 10.20 | 11.20 |

AMMONIA

| Size, Dial | inches | 41_{2} | 5 | $5\frac{1}{2}$ | 6 | 63_4 | 815 |
|-------------------|-----------------|----------|-------|----------------|-------|--------|-------|
| Price, Iron Case, | N. P. Ring each | 25.50 | 30.50 | 30.50 | 35.50 | 40.60 | 45.75 |

GAUGES. CLOCKS. ETC.

TEST GAUGE

LOCOMOTIVE, MARINE AND ENGINE ROOM CLOCK

CRANK INDEX







Fig. 7035A

Fig. 7035B

Fig. 7035C

TEST GAUGES

| Size, Dialinches | | | / T | |
|---|------|------|---------|------|
| Price, Brass Case 'each " Nickel Plated " | | | | |

When ordering, do not fail to state the pressure to which you wish the Gauge graduated. Test Gauges should be graduated to at least 25 per cent beyond the highest working pressure.

INSPECTOR'S TEST GAUGES

| Price | e, 3 | inc | h, | Nic | kel | P | ated | Brass | Case | | | | .each | 14. | 60 | |
|-------|------|-----|----|-----|-----|---|------|-------|------|------|------|------|-----------|-----|----|--|

This Gauge is made in one size only, 3 inch dial. It is designed more particularly for inspector's use, and is made as compact and light as possible, for convenience in carrying in pocket or small case.

LOCOMOTIVE, MARINE, AND ENGINE ROOM CLOCKS

| Size. Dialinches | 634 | 81/2 | 10 | 12 | 63/4 | 81/2 | 10 | 12 |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|----------------|
| Movement | Howard | Howard | Howard | Howard | Seth Thomas | Seth Thomas | Seth Thomas | Seth Thomas |
| Price, Brass Case.each "Nickel Plated" | 70.00 72.00 | 80.00 82.50 | 90.00 93.00 | 110.00 114.00 | 45.00 47.00 | 55.00 57.50 | 65.00 68.00 | 90.00 94.00 |
| Size, Dialinches | 5 | 51/2 | 6 | 634 | 81/2 | 10 | 12 | · · · · · |
| Movement Price, Brass Case.each "Nickel Plated" | Boston 35.00 36.00 | Boston 38.00 39.25 | Boston 40.00 41.50 | Boston 45.00 47.00 | Boston 55.00 57.50 | Boston 65.00 68.00 | Boston 90.00 94.00 | •••• |

CRANK INDEXES

| Size, Dial | inches | 81/2 | 10 | 12 |
|----------------------------------|--------|-------|-------|-------|
| Price, Composition Case and Ring | each | 50.00 | 60.00 | 75.00 |

This instrument is used when working engines by the starting bar, to indicate the position of the crank when it cannot be seen from the engineer's position.

AMERICAN GAUGE TESTERS

DEAD WEIGHT TESTER

INSPECTOR'S OUTFIT

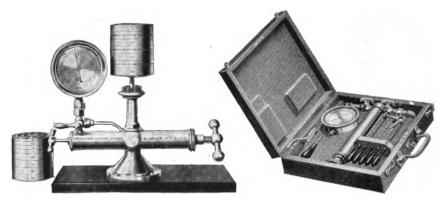


Fig. 2060A

Fig. 2060B

DEAD WEIGHT GAUGE TESTERS

(Patented)

These testers possess all the advantages of the mercury columns enclosed in a much smaller space and supply a long-felt want for a testing apparatus which can be relied upon to be absolutely accurate at all times.

upon to be absolutely accurate at all times.

They do away with test gauges and eliminate the bother usually experienced where it is necessary to return test gauges to the factory from time to time in order to be sure of their accuracy.

All tests are made with dead weights in five-pound units furnished for any desired pressure up to 2000 pounds.

| Weight for Testing up topounds | 200 300 | 500 | 800 | 1000 | 1500 | 2000 |
|--------------------------------|---------------|--------|--------|--------|----------------|---------------------|
| Priceeach | 100.00 120.00 | 140.00 | 170.00 | 200.00 | $300.\bar{0}0$ | $400.\overline{00}$ |

INSPECTOR'S OUTFIT

This outfit is especially adapted for steam-boiler inspectors. It is furnished in polished mahogany, velvet lined case.

It consists of:

One No. 3 nickel plated test pump.

One 3-inch or 31/2-inch nickel plated standard test gauge.

One hand puller. One hand set. One pair pliers.

One screw driver. Broaches and files.

Price each 40,00



RICHARD THOMPSON & CO.'S INDICATORS, ETC.

126 LIBERTY STREET, NEW YORK CITY

20TH CENTURY INDICATOR

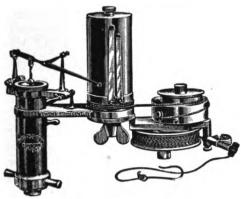
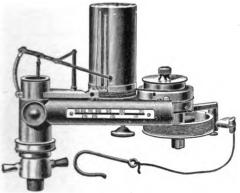


Fig. 7934A

BACHELDER ADJUSTABLE SPRING INDICATOR



Pig. 7934B

PLANIMETER

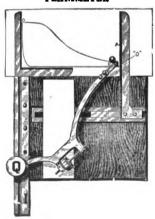


Fig. 7934C

| Price | , 20th Century Indicator | .each | 50.00 |
|-------|---|-------|-------|
| •• | " " for Ammonia | . " | 60.00 |
| 44 | Bachelder Adjustable Spring Indicator | . " | 75.00 |
| • 6 | " " Ammonia | . " | 85.00 |
| 4 | Ideal Reducing Wheels with Bushing for All Stroke Engines | . " | 15.00 |
| 44 | Planimeter Complete in Plush Lined Morocco Case | . " | 20.00 |

In ordering planimeter state for what indicator wanted. Planimeter cut shows diagram in position and the tracer at starting point ready for use.

REVOLUTION COUNTERS

MODEL A

MODEL B





Fig. 7956B

MODEL A

| | | | | PRICE EACH | | | |
|---------------|-------------------|---|------------------|--------------------------|---------------------------|-----------------------|--|
| Style | No. of Figures | Size Inches | Weight Pounds | Plain | With Guard and Lock | With Alarm Bell | |
| $-rac{1}{2}$ | 4 5 6 | 7 x 2 ¹ 4 x 1 ³ 4 8 ¹ ⁄ ₂ x 2 ¹ 4 x 1 ³ 4 10 x 2 ¹ ⁄ ₂ x 1 ³ 4 | 3 3!4 4 | $8.50 \\ 10.00 \\ 12.00$ | 10.00 12.00 14.00 | 13.00 15.00 | |

In ordering alarm counters, state the figure at which alarm is to sound.

MODEL B

| l'.a.n | 5 | $3\frac{1}{8} \times 2\frac{1}{4} \times 1\frac{3}{4}$ | 2 | 10.00 | 10.50 | |
|--------------------|---|--|----------|-------|-------|--|
| ! tautancous Reset | 5 | 4 x 21 x 13 i | 2 | 14.00 | | |
| Star Wheel | 5 | $4 \times 2^{\frac{1}{4}} \times 1^{\frac{3}{4}}$ | 2 | 12.00 | | |
| Rotary | 5 | $4 \times 2^{\frac{1}{4}} \times 1^{\frac{3}{4}}$ | 2 | 12.00 | | |
| Lineal | 5 | 4 x 214 x 134 | 5 | 20.00 | | |

Other sizes made to order.

MODEL C



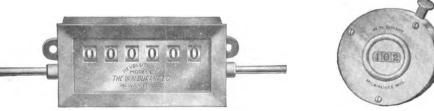


Fig. 7956C

Fig. 7956D

MODEL C

| Style | No. of Figures | Size Inches | Weight Pounds | Price Each |
|-------|-------------------|--------------------------------|---------------|------------|
| Plain | 6 | $5 \times 2_{-4} \times 2_{-}$ | 3 | 15.00 |

Other sizes made to order,

HAND TALLY

| ·= | · | ~ _ | | |
|--------|-------------|-----|---------------|------------|
| Style | Size Inches | 1 | Weight Ounces | Price Each |
| | | | | |
| 3 Dial | 2 \pm | | 6 | 3.00 |
| _ 4 " | 218 | ! | 6 | 4.00 |

BRISTOL RECORDING INSTRUMENTS

THERMOMETERS

Class 2—For working ranges of temperature between 90° F. and 500° F.

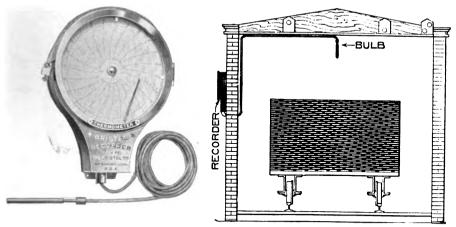


Fig. 1040A

Fig. 1040B

These thermometers are especially adapted for dry kilns, ovens, heaters and similar applications.

They depend for their operation upon the pressure of a vapor of a liquid in the sensitive bulb which is exposed to the changes of temperature to be recorded. The liquid, usually alcohol, is contained in a small bulb which it partly fills. This bulb is connected to the recording instrument by a small flexible copper tube 25 feet or more in length.

Variations of temperature at the sensitive bulb cause corresponding variations of pressure in the vapor of the liquid confined in this bulb and these pressures are transmitted through the flexible copper capillary connecting tube to the recording instrument, where these changes in pressure or temperature are recorded. In this way the temperature at the sensitive bulb is measured and the records of this are absolutely independent of changes of temperature along the connecting tube or at the recording instrument, provided that the temperature at the sensitive bulb is always higher than the temperature at any point of the connecting tube or recording instrument. The vapor tension in the sensitive bulb responds almost instantly to changes of temperature at the bulb, making these thermometers extremely sensitive and positive in their action.

The diagrammatic sketch illustrates one method of applying Bristol's Class II. Recording Thermometers to dry kilns. The sensitive bulb is suspended centrally inside the kiln near to the lumber which is being dried and the recording instrument itself is installed outside of the kiln, the bulb and the recorder being connected by a suitable length of flexible copi er tubing. Bristol's Class II. Recording Thermometers are extensively used for dry kiln temperatures to great advantage, and this long distance feature makes them particularly suitable for applications of this kind, where it would be undesirable to have the recording instrument located at an inaccessible position inside the kiln, because there its working parts would be exposed to injurious temperatures and observation of the record would be difficult.

| Size Chart | inches | *6 | 8 | 12 |
|-----------------------------------|--------|----------------|----------------|-----------------------|
| Price, Enamel Finish, Nickel Door | . each | 41.00 46.00 | 61.00 66.00 | $\frac{71.00}{76.00}$ |

Furnished with connecting tube 25 feet in length. Extra length, 40 cents per foot. Prices include 100 charts, bottle of special recorder ink, lock and key.

*Bristol Recording Thermometer, equippe I with 6 inch chart has same quality operating parts as 8 inch and 12 inch models, but a different style of case for instrument,

BRISTOL RECORDING INSTRUMENTS

PRESSURE AND VACUUM GAUGES ROUND FORM ORIGINAL FORM





Fig. 1075A

Fig. 1075B

| Size (| Chartinche | s 12 | 8 |
|--------|---|--------------------|-------|
| Price, | *Original Form, Full Nickel Finish, Bronze Caseeach | $\overline{60.00}$ | 50.00 |
| " | " Enamel Finish, Bronze Case, Nickel Door " | 55.00 | 45.00 |
| 44 | Portable "Light Carrying Case" | 60.00 | 50.00 |
| 44 | Moisture proof Form, Black Finish, Iron Case | 73.00 | 62.00 |
| 66 | Water " " " " " " " " " " " " " " " " " " " | 76.00 | 65.00 |

*Also furnished to order in other finishes, such as brass or copper plate, etc., at same price as full nickel finish.

ROUND FORM

| Size Chartinches | 8 | 6 |
|--|-------|-------|
| Price, Full Nickel Finisheach | | |
| " Black Finish, Nickel Front " | 35.00 | 25.00 |
| " Eccentric Front, Full Nickel Finish" | | 30.00 |
| " Eccentric Front, Full Nickel Finish " " " Black Finish, Nickel Front " | | 25.00 |

Prices include, with each gauge, 100 charts, bottle special recorder ink, pen filler, lock and key, clock key, union connection, etc.

EXTRA CHARTS

| Price, 8 or 6-inch | per 100 | .75 | Price, | 12-inc | hper 100 | 1.50 |
|--------------------|---------|------|--------|--------|-----------------|------|
| " " (Copying In | k) " | .85 | ٠٠ | " | (Copying Ink) " | 1.75 |
| " " (Two Colors | s)" | 1.25 | " | " | (Two Colors) " | 2.00 |

SPECIAL RECORDING INK

| Size Bottle | 1 oz. | 4 oz. | ½ pt. | 1 pt. | 1 qt. |
|-------------|-------|-------|-------|-------|-------|
| Priceeach | .25 | .60 | 1.00 | 2.00 | 4.00 |

Combination rubber stopper and glass filler, each .05.
Bristol recording gauges have been adapted to hundreds of different applications, requiring a great variety of charts, ranges and clock speeds. We will furnish special catalogues on request, covering gauges with charts registering as follows:

Pounds per square inch Inches head of water

Feet head of water

Atmospheres Tons for hydraulic presses

Metric units

Ounces per square inch

We will also furnish, on request, special catalogues for the following instruments: Recording voltmeters, recording water level gauges, recording ammeters, time recorders, recording wattmeters.

PITTSBURGH RECORDING PRESSURE AND VACUUM GAUGES



Fig. 9348A

PRESSURE

| Chart No. | Graduations | Total Scale | Chart No. | Graduations | Total Scale |
|--|--|-------------|---|---|---|
| 19 15 28 29 13 91 94 88 81 | 15 in. head of water 1 " " " " 1 oz. per sq. inch 1 " " " 14 lb. " " " 12 " " " " 21 " " " " | 0 " 36 " | 74 75 35 30 39 64 26 203 | 5 lbs. per sq. inch 10 " " " " 10 " " " " 10 " " " " 50 " " " " 50 " " " " | 0 to 150 pounds 0 " 180 " 0 " 200 " 0 " 350 " 0 " 500 " 0 " 1000 " 0 " 1500 " |

VACUUM

| 02 | 1-10 in. head 1-10 " " | of water | 0 to 1 inch 0 " 2 inches | 12 93 | ½ in. head of water " " mercury | 0 to 12 inches 0 " 30 " |
|-----|---------------------------|----------|-----------------------------|----------|----------------------------------|----------------------------|
| 214 | 1-5 " " | " | 0 " 8 _ " | | | |

COMBINATION PRESSURE AND VACUUM

| 18 | 1-10 in, head of water | 2 in. vacuum 4 " pressure | 94 | vac. in mercury and 30 in. vacuum pres. lbs. per sq. in. 50 lbs. pressure |
|-----|------------------------|------------------------------|----|---|
| 303 | 1-5 in. head of water | 3 " vacuum 3 " pressure | 5 | vac. in mercury and 30 in. vacuum pres. lbs. per sq. in. 50 lbs. pressure |
| 95 | 1/2 in. head of water | 6 "vacuum 6 "pressure | | |

Price each, including lock and key, union cock, ink and 100 charts, 50.00. Charts 8 inches in diameter. One complete revolution of chart every 24 hours.

This gauge may be placed near the boiler or any distance therefrom in the office, for instance, where every fluctuation may be observed instantly. The Pittsburgh Recording Gauge complies with every requirement of the mining laws, and can be easily attached to mine fans to record either pressure or vacuum. or both. Made of the best quality of brass, highly polished, and heavily nickel plated.

NEWMAN WATCHMAN'S TIME DETECTORS

Approved by National Board of Fire Underwriters and all Mutuals
PORTABLE WATCHMAN'S CLOCKS
OUT OF POUCH
SIDE VIEW

Showing thickness of Top and Main Plates, Key Guide and Cover Lock



Fig. 2923A



Fig. 2923B

Newman portable watchman's time detectors are made in the following sizes: Nine, sixteen, twenty-four and thirty-five key size. The case is substantially made of aluminum, combining lightness and strength, with tight fitting hinged lid and reinforced keyhole. The use of aluminum prevents tarnish or injury from acid or grease. The case is equipped with a pricking device which registers upon the paper dial each and every opening and closing of the clock, such registration showing the exact time of opening or closing.

STATIONARY WATCHMAN'S TIME DETECTORS Approved by National Board of Fire Underwriters For limited use

REGULATOR No. 1

REGULATOR No. 2



Fig. 2923C



Fig. 2923D

Both regulators have 8-day movements. In addition to this the No. 2 regulator has a 7-day dial. The registration punch device is on the left side of case. Tamper-proof lock registers on dial each opening and closing of case. Guaranteed to be close time keepers. Handsomely finished in oak or cherry.

NEWMAN PATROL KEY BOXES

MODEL No. 3

CLOSED With Brass Lock



OPEN Showing Lock and Marking Key



Fig. 6281A

Fig. 6281B

Newman No. 3 model patrol key box with brass lock, prevents loss of marking keys by theft or malicious mischief. It has countersunk escutcheon, which facilitates entrance of the key at night.

In response to repeated inquiries for a patrol box of such construction that the key is secure from theft, etc., we have designed this new iron box with that end in view. It is convenient in form for attachment to posts, poles, walls, etc., and is cast especially heavy to withstand attempts at malicious destruction. By a novel arrangement provided in the design, the key chain should never jam when closing the door, which is held securely closed by means of a simple, yet effective form of brass lock. All boxes are opened with the same master key.

Patrol key boxes should be located so that the important points for inspection are included in each tour of the watchman. They are fastened with two flat-headed screws. over which seals are placed, each seal to bear the signature of the superintendent or an official before being attached. The boxes can be removed from one position to another when occasion requires without expense, extra seals being furnished without charge.

MODEL No. 1



Lid raised showing marking key attached by Newman German silver chain. This is the only chain made that cannot be cut or tampered with without detection.

This was the first key receptacle to properly hold patrol keys and the first to receive the approval of the National Board of Fire Underwriters.

The Newman portable watchman's clock has been adopted by many of the largest industrial corporations, railroads, interurban and street railways, hospitals, asylums, hotels, clubs and by the government in many departments. It is conceded to be the standard watchman's clock of the world. This system supersedes the electrical watchman's clock system as it eliminates all the complicated mechanisms, defective magnetos, unreliable batteries, corroding and dangerous wires, which

must attend the use of any electrical system.

Prices of clocks, patrol boxes, etc., on application.

THE BURT VENTILATORS

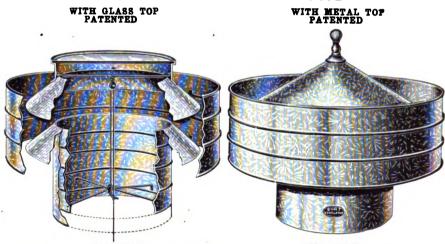


Fig. 3206A

Fig. 3206B

| | 0 | | | | | | | | |
|----------------------|-------------------------------------|----------------------|-----------------------------|-----------------------------|---|--|--|--|--|
| Diameter | Diameter | Gauge | NET WEIGHT W | ITHOUT CRATING | Price | | | | |
| of Neck Inches | Outside of Rim or Band Inches | of Iron Number | With Glass Top Pounds | With Metal Top Pounds | With Patent Sliding Sleeve Damper Each | | | | |
| 12 | 22 | 22 | 20 | 17 | 5.00 | | | | |
| 14 | 24 | 22 | 24 | 20 | 7.50 | | | | |
| 16 | 26 | 22 | 30 | 24 | 10.00 | | | | |
| 18 | 29 | 20 | 34 | 28 | 12.50 | | | | |
| 20 | 32 | 20 | 42 | 33 | 15.00 | | | | |
| 24 | 38 | 20 | 56 | 45 | 18.00 | | | | |
| 30 | 46 | 18 | 105 | 90 | 25.00 | | | | |
| 3 6 | 54 | 18 | 155 | 130 | 37.50 | | | | |
| 40 | 64 | 18 | 200 | 175 | 50.00 | | | | |
| 42 | 68 | 18 | 225 | 190 | 54.00 | | | | |
| 48 | 78 | 18 | 320 | 300 | 60.00 | | | | |
| 54 | 86 | 18 | 400 | 350 | 70.00 | | | | |
| 60 | 94 | 16 | 480 | 430 | 80.00 | | | | |
| 66 | 102 | 16 | 550 | 500 | 90.00 | | | | |
| 72 | 110 | 16 | 675 | 600 | 100.00 | | | | |

The illustration showing the Ventilator with Glass Top, shows the construction when used both as a skylight and a ventilator. The top is of heavy wired glass, set in a groove and made absolutely water tight.

Below the glass top is a trough which receives any condensation that may gather on

the glass, this condensation passes through small holes to the outside.

The damper used in all these ventilators consists of a sliding sleeve, operated from below by means of a cord and pulley. When the sleeve is at the highest point it closes the ventilator, but does not obscure the light.

After once being adjusted the damper is held permanently in any place by a special arrangement, so that it is not necessary to fasten the cord to a nail, hook or post, as is the case where the common flat damper is used.

The damper does not collect dust and is not affected by air currents. The pulling power is greater than other makes owing to the fact that the air shaft is unobstructed. Guaranteed absolutely storm proof.

Galvanized steel bands are used instead of common black iron bands.

Size Thread....inches

46

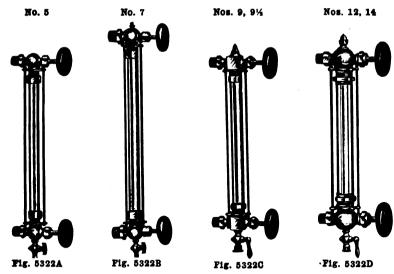
each

5/8 x 12 12.00

" Glass

Price, Four Guard ...

SELF-CLEANING WATER GAUGES



| WATER | GAUGES. | FINISHED | ROUND | BODY-Wood | Wheels |
|-------|---------|----------|-------|-----------|--------|

| WAILH GA | ours, | 11113111 | D HOOND BOD! WO | ou wheels | |
|------------------------------|---------|----------|---------------------|--|--------------------------------|
| Number | | | | 5 | 7 |
| " Glass | | | incheseach | 5/8 x 12 5.00 | $\frac{34}{6.25}$ x 16 |
| WATER GA | UGES, | FINISH | ED ROUND BODY-Iron | n Wheels | |
| Number | | | | 4 | G |
| " Glass | | | inches " each | 5/8 x 12 4.50 | $\frac{34}{34} \times 16$ 5.50 |
| WATER GAL | JGES, F | INISHE | D SQUARE BODY-Wo | od Wheels | 3 |
| Number | | | | 9 | 91/2 |
| " Glass | | | inches " each | $\frac{\frac{1}{2}}{\frac{5}{8} \times 12}$ 6.00 | 3/4 x 16 8.00 |
| WATER GA | UGES, I | FINISHE | D SQUARE BODY-IT | on Wheels | 3 |
| Number | | | | 8 | 81/2 |
| " Glass Price, Four Guard | | | each | 5/8 x 12 5.25 | 3/4 x 16 7.25 |
| WATER GA | UGES, I | FINISHE | D ROUND BODY-Wo | od Wheels | } |
| Number | 12 | 14 | Number | 11 | 13 |
| | | | | 1 / | 9 / |

Note—Numbers 4 and 6 are illustrated by numbers 5 and 7 but have iron wheels. This applies to 8, 8½ and 9, 9½. Numbers 11 and 13 are illustrated by numbers 12 and 14 but have two guards instead of four.

34 x 16 15.00

each

Size Thread ...inches

" Glass "

Price, Two Guard . .

3/4

3/4 x 16

1/2

5/8 x 12

10.00

WATER COLUMN BODIES AND COMBINATION WATER AND STEAM GAUGES

BODIES ONLY



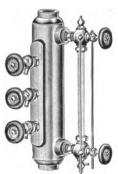


Fig. 3133A

FINISHED BRASS

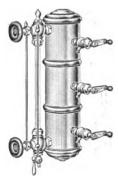
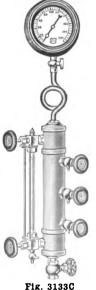


Fig. 3133B

| Description | | | | | FINISHED BRASS | | | | | |
|---------------------------|-------|-----------------|-------------------|------|----------------|-------|----------|-------|--|--|
| Number | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | | |
| Length inches | 131/8 | 163/4 | 18% | 2358 | 12 | 15 | 19 | 23 | | |
| Boiler Connections " | 1/2 | 34 | 1 | 11/4 | 3/4 | 34 | 11/4 | 114 | | |
| Water Gauge Connections " | 1/2 | 1.3 | 34 | 3/4 | 13 | 1/2 | 12, 34 | 34 | | |
| Center to Center " | 10 | 12^{1} $_{2}$ | 14 | 18 | 10 | 12 | 14 | 18 | | |
| Gauge Cock Holes " | 3 8 | 1/2 | 1/2 | 3/4 | 1/2 | 1/2 | 1/2, 3/4 | 34 | | |
| Price, Bodies onlyeach | 2.75 | 4.00 | $6.0\overline{0}$ | 8.00 | 18.00 | 21.00 | 28.00 | 34.00 | | |



| COMBINATION GAUGES COMPLETE | | | | | | | | | | |
|-----------------------------|---|-------|-------|-------|--|--|--|--|--|--|
| · | | | | | | | | | | |
| Number | 1 | 2 | 3 | 4 | | | | | | |
| Priceeach | | 40.00 | 50.00 | 60.00 | | | | | | |

TRIMMINGS IN COMBINATION GAUGES

| 1 | 2 | 3 | 4 |
|-------|--|---|---|
| -2 | 3 _ | 3 | 3 |
| 3 8 | 1.2 | 1., | 34 |
| 1 | 1 | 1 | 1 |
| 5 | 5 | 6 | 6 |
| 1/3 | 1., | 34 | 34 |
| 1/3 | 1/2 | 3 7 | 3.4 |
| 14 | î. | 14 | 14 |
| ½ x ¼ | 1/2 x 1/4 | 34 x 14 { | 114 x 14 |
| | 2 3/8 1 5 1/2 1/2 1/4 1/2 x 1/4 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

For other combinations than above, add the price of trimming as shown in the above list, or prices of any other trimmings, as may be preferred.

The prices above are suitable for pressures up to and including 75 pounds. For pressures up to 250 pounds, the same bodies may be used, but extra heavy gauge cocks and water gauges must be used.

When trimmed otherwise, we do not recommend it for pressures above 175 pounds pressure.

When not otherwise specified, complete combination gauges will be trimmed and furnished as in above list.

RELIANCE SAFETY WATER COLUMNS

SECTIONAL Combined High and Low Water Alarm

Low Water Alarm





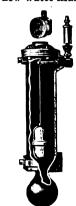


Fig. 7247A

Fig. 7247B

Fig. 7247C

| Co | MBINED HIGH A | ND LOW | WATER | ALARMS | | | GENERA | L DIMEN | sio | xs, 1 | INCHES | | |
|--|--|--------------------------------------|--|--|---|--|--|--|------------------------------------|--|---|---|---|
| Number of Column | Kind and Size of Boiler Inches | Variation Between Alarms Inches | Price Columns Only Each | Price Water Gauge and Gauge Cocks | Steam and Water Connections | Blow Off | Water Gauge | Gauge Glass | Gauge Cocks Centers | Gauge Cocks | Center of Water Connection to Top of Column | Diameter of Column | Length Over All |
| 1 1½ 5 7 9 11 13 15 | 36 to 54 36 to 54 54 to 72 Water Tube Vertical | 6 8 12 18 24 30 36 | 28.00 28.00 30.00 35.00 40.00 42.50 45.00 50.00 | 7.00 7.00 10.00 10.00 10.00 12.50 20.00 20.00 | 1 11/4 11/4 11/2 11/2 11/2 11/2 11/2 | 1/2 3/4 3/4 3/4 1 1 1 1 | 1/2 x14 1/2 x14 3/4 x18 3/4 x21 3/4 x26 3/4 x32 3/4 x38 3/4 x44 | 58 x12 58 x12 34 x16 34 x19 34 x24 34 x30 54 x36 34 x42 | 3 4 6 9 12 10 12 | 1/2 1/2 3/4 3/4 3/4 3/4 3/4 3/4 3/4 3/4 | $\begin{array}{c} 16 \\ 19\frac{3}{4} \\ 20\frac{1}{2} \\ 26 \\ 33\frac{1}{2} \\ 37\frac{3}{4} \\ 52\frac{1}{2} \\ 58\frac{1}{2} \end{array}$ | 4½ 5¼ | 231,1 281,4 291,2 36 44 48 64 70 |
| | Low V | Vater Ala | arms | | | | Genera | l Dimen | sion | s, Iı | nches | | |
| 2 6 8 | 36 to 54 54 " 72 Vertical | | 25.00 28.00 35.00 | 7.00 10.00 10.00 | 1 1½ 1½ 1½ | 1/2 3/4 3/4 | ½x14 ¾x16 ¾x21 | 5/8 x12 3/4 x14 3/4 x19 | 3 4 6 | 1/2 3/4 3/4 3/4 | 16 18 ¹ ⁄ ₄ 26 | 3 ³ / ₄ 4 ¹ / ₄ 5 ¹ / ₄ | 231 ₄ 271 ₄ 36 |

Nos. 13 and 15, two glasses joined at center with stuffing box. Four gauge Larger sizes made to order.

All Reliance Columns are tapped for gauge-cock holes on either side, obviating any trouble with rights and lefts and making them available for either side of the boiler.

"PITTSBURGH" SAFETY WATER COLUMNS







Pie 9144

Always positive, one float, one float rod, one frictionless valve, one valve lever. As the water in boiler falls to level of bottom gauge cock, the float falls, and top

As the water in boiler falls to level of bottom gauge cock, the float falls, and top knocker opens the valve. In reverse manner, alarm for high water is sounded when water reaches level of top gauge cock. Knockers can be adjusted to blow high and low water alarms with 2-inch or greater variation.

Simplest valve; only 3 parts; closes independently of pressure; is always positive and not affected by foaming of water in boiler.

Only safety water column in which seamless copper floats are used. Guaranteed not to collapse or fill with water. Tested 400 pounds pressure.

| | | | | | - | 20 | | PRICE | EACH | | |
|--------|--------------------------|---|-------------------------------------|---------------------------|---|-----------------------------|--|--|---|---|--|
| | | | B. | 30 | eel | in | JAPA | NNED | FINISHE | D Bass | |
| Number | Pressure in Pounds | Size of Boiler Connections Inches | Variation be ween Alar Inches | Length of Glass Inches | Distance between Gauge Cocks Inches | Size of Trimmings Inches | Without Gauge Cocks or Water Ga'ges | With Gauge Cocks and Water Ga'ges | Without Gauge Cocks or Water Cocks | With Gauge Cocks and Water Cocks | |
| 0 | Any Pressure | 11/2 | 15 | 24 | 71/2 | 3/4 3/4 | 40.00 | 50.00 | 100.00 | 110.00 | |
| 1 | Any Pressure | 114 | 9 | 17 | 41/2 | 3/4 | 30.00 | 40.00 | 80.00 | 90.00 | |
| 11/2 | B. & W. Style | 114 | 8 | 12 | 4 | 3/4 | 30.00 | 40.00 | 80.00 | 90.00 | |
| 2 | Any Pressure | 11/4 | 7 | 12 | 31/2 | 1/2 | 28.00 | 35.00 | 70.00 | 80.00 | |
| 3 | Any Pounds | 1 | 6 | 10 | 3 | 1/2 | 26.00 | 32.00 | 60.00 | 70.00 | |

When these columns are trimmed with Pittsburgh Rotating Gauge Cocks (lever style), each column 5.00 extra.

GENERAL DIMENSIONS

| Number | . 0 | 1 | 11/2 | 2 | 3 |
|--|------|-------|-------|-------|------|
| Length Over Allinche | | 341/2 | 321/2 | 281/2 | 2434 |
| Diameter of Body | 51/2 | 51/2 | 51/2 | 5 | 5 |
| Center to Center of Gauge Cocks | 71/2 | 41/2 | 4 | 31/2 | 3 |
| " " " Water Gauge Connections " | 2537 | 18 | 14 | 14 | 12 |
| Steam and Water Connections " | 11/2 | 11/4 | 11/4 | 1!4 | 1 |
| Water Gauge and Gauge Cock Connections " | 34 | 3/4 | 34 | 1/2 | 1/2 |

No. 11/2 has side connections for steam and is used on B. & W. boilers.

SCOTCH GAUGE GLASSES



Fig. 795A

| Lengthinches | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|------------------------------|---------------------|---|---------------------|---------------------|----------------|--------------|--------------|----------------------|-----------------|
| Price, 12 and 5%-in.per doz. | 3.00 | 3.24 | 3.60 | 3.84 | 4.20 | 4.44 | 4.80 | 5.04 | 5.40 |
| " 34-inch " | 3.60 | 3.96 | 4.32 | 4.80 | 5.16 | 5.52 | 5.88 | 6.24 | 6.60 |
| " 1 ⁷ 8 " … " | $\frac{5.04}{6.12}$ | $\begin{array}{c} 5.64 \\ 6.72 \end{array}$ | $\frac{6.12}{7.32}$ | $\frac{6.60}{7.92}$ | $7.08 \\ 8.52$ | 7.56 9.12 | 8.16 9.72 | $\frac{8.64}{10.32}$ | $9.12 \\ 10.92$ |
| Lengthinches | 19 | 20 | 22 | 24 | 30 | 36 | 48 | 60 | 72 |
| Price, 12 and 58-in.per doz. | 5.64 | 6.00 | 6.60 | 7.20 | 9.00 | 10.80 | 14.52 | | 21.84 |
| " 34-inch " | 7.08 | 7.44 | 8.16 | | | | 18.00 | | 27.12 |
| 4 7/8 " ····· " | 9.60 | 10.20 | | | | | 24.36 | | 36.48 |
| " 1 " " … " | 11.52 | 12.12 | 13.44 | 14.64 | 18.24 | 21.96 | 29.16 | 36.48 | 43.80 |

60 x 114 inches, per dozen, 60.00

RED REFLECTING GAUGE GLASSES

| Lengthinches | | | | | 14 | | | 17 |
|--------------------------|--------------|--------------|---------------|------------------|------------------|-----------------------|-----------------------|--------------|
| Price, 5/8-inchper dozen | 4.80 6.00 | 4.80 6.60 | 5.40 6.60 | 5.40 6.60 | 6.00 7.20 | $6.60 \\ 7.20$ | 7.20 7.80 | 7.80 8.40 |
| Lengthinches | 18 | 19 | 20 | 22 | 24 | 30 | 36 | |
| Price, 5/8-inchper dozen | 8.40 9.00 | 9.00 9.60 | 9.60 10.20 | $10.80 \\ 11.40$ | $12.00 \\ 12.60$ | $\frac{22.00}{24.00}$ | $\frac{28.00}{32.00}$ | |

GLASS TUBE CUTTERS

FAVORITE



BOSTON



ON CHESTERTON



Fig. 795C

JELCO

Fig. 795E

| Price | Favorite. | .each | .60 |
|-------|------------|-------|------|
| ≪ ' | Jelco | | 1.50 |
| • | Boston | | 1.50 |
| - | Chesterton | 4.6 | 2.00 |



GAUGE GLASS WASHERS, ETC.

ROUND

SOUARE

GILBERT'S SELF-PACKING GAUGE GLASS PROTECTOR







Fig. 7746B

| Size | inches | 1 2 | 58 | 3, | 1 |
|------------------------------------|-----------|-----|-----|-----|------|
| Price, Round, Half Round or Square | per dozen | .25 | .25 | | 0 |
| " Square, Extra Heavy | | .50 | .50 | .70 | 1.00 |
| " Gilbert's | per box | .60 | .60 | .60 | .60 |
| 1 57 1 2 1 1 | | | | - | . — |

 $\frac{1}{22}$, $\frac{5}{8}$, and $\frac{3}{4}$ inch, packed one dozen in a box; 1-inch, packed $\frac{1}{2}$ dozen in a box.

STANDARD

MARINE FUSIBLE PLUGS

LONG



These plugs are filled with Banca tin, fulfilling in every respect the requirements of the Steamboat Inspection Service of the United States Government. In ordering, specify whether to be inserted from inside or outside of boiler shell.



Pig. 7746E

| Size | inches | 1 2 | 34 | 1 | 11, | 116 | 2 |
|-----------------|-----------|------|------|------|------|------|------|
| | | | | | | | |
| Price, Standard | " | 1.20 | 1.50 | 2.00 | 3.00 | 4.00 | 6.00 |
| " Long | <u></u> " | 1.20 | 1.50 | 2.00 | 3.00 | 4.00 | 6.0 |

LOW WATER ALARMS

LUNKENHEIMER



Fig. 7746F

DETROIT



Fig. 7746G

LUNKENHEIMER

| Price, Low Water Alarm | each 7.00 |
|------------------------------|------------------|
| <u>* Extra Fusible Discs</u> | per dozen † 2.20 |
| DETROIT | |
| Price | each 15.00 |

STEAM WHISTLES

PLAIN



WITH VALVE







Fig. 7860B



Fig. 7860C

PLAIN WHISTLES-WITHOUT VALVE

| Diameter of Bellinches | 1 | 11/4 | 11/2 | 2 | $2\frac{1}{2}$ | . 3 | 31/2 |
|---------------------------------------|-------------------------------|-------------------|-------|-------|----------------|--------|------|
| Length of Bellinches Size of Pipe" | $\frac{-2\sqrt{2}}{\sqrt{1}}$ | 3 | 314 | 4 | 41/2 | 5 | 53/4 |
| Priceeach | 2.20 | $2.7\overline{5}$ | 3.00 | 4.35 | 5.25 | 7.25 | 9.50 |
| Diameter of Bellinches | 4 | 5. | 6 | 8 | 10 | 12 | |
| Length of Bellinches | 61/2 | 8 | 91/2 | 14 | 16 | 22 | |
| Size of Pipe " | 114 | 11/2 | 2 | 21/2 | 3 | 3 | |
| Priceeach | 12.00 | 19.00 | 24.00 | 70.00 | 175.00 | 350,00 | |

WHISTLES WITH VALVE-ADJUSTABLE LEVER

| Diameter of Bellinches | 1 | 114 | 11/2 | $\frac{1}{2}$ | 21/2 | 3 | 31/2 |
|--------------------------|----------------|-------|---------------|----------------|--------|--------|-------------------|
| Length of Bellinches | $2\frac{1}{2}$ | 3 | -3^{1}_{64} | 4 | 41/2 | 5 | 5^{3}_{-4} |
| Size of Pipe " Priceeach | 3.10 | 3.75 | 4.00 | 5.50 | 6.50 | 8.50 | $\frac{1}{11.50}$ |
| Diameter of Bellinches | 4 | 5 | 6 | 8 | 10 | 12 | |
| Length of Bellinches | 61/2 | 8 | 91/2 | 14 | 16 | 22 | |
| Size of Pipe " | 11/4 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 3 | |
| Priceeach | 15.00 | 22.50 | 33.00 | 95.00 | 225.00 | 425.00 | · · · · · |

Brass Whistles with longer bell than standard made to order.

WHISTLE VALVES-BRASS

| Sizeinches | 3/8 | 1/2 | 34 | 1 | 1!4 | 11/2 | 2 | 2^{1} | 3 |
|------------|------|------|------|------|------|------|----------|---------|-------|
| Priceeach | 2.00 | 2.50 | 3.00 | 3,50 | 5,00 | 6.00 | 9,00 | 18.00 | 27.00 |



IRON GONG WHISTLES

| Diam. of Gong, in. | 4 | 6 | 8 | 10 | 12 |
|------------------------------|-------|-------------|-------|-------|-------|
| Size of Pipein. Priceeach | 1 14 | 1^{1}_{2} | 2 | 21.2 | |
| Price each | 12.00 | 16.00 | 20,00 | 30,00 | 50.CO |

The above prices do not include whistle valves.

It is made entirely of iron and will last forever, and makes a sound entirely different from an ordinary whistle.

It can be heard distinctly from six to eight miles.

LUNKENHEIMER STEAM WHISTLES

SINGLE BELL CHIME WHISTLES

ALL BRASS WITH ADJUSTABLE LEVER



Fig. 801A

IRON BASE WITHOUT VALVE



Fig. 801B

LOCOMOTIVE STYLE WITH UPRIGHT VALVE



Fig. 801C

| Diameter of Bellinches | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|---|---|-------|--------|--------|--------|---|
| Size of Pipe | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | |
| Diameter of Bellinches | 5 | 6 | 8 | 10 | 12 | |
| Size of Pipe | 44.00 | 60.00 | 145.00 | 235.00 | 400.00 | |
| " without Valve" Iron Base, without Valve" Brass, Locomotive Style" | 33.00 | 45.00 | 108.00 | | 340.00 | |

THREE-WHISTLE CHIMES

Number 1



Fig. 801D

| Size of Pipe | | | | inches | 1 |
|-----------------------------------|-------------|------------|--------|--------|-------|
| Price, one 1½, 2, and 2½, 2, " 2½ | 2-inch Whis | tles, Iron | Branch | , each | 22.00 |
| " " $1\frac{1}{2}$, 2, " 2) | <u>,</u> " | Bras | 88 " | " | 27.00 |

 Number 2

 Size of Pipe.
 inches
 2

 Price, one 3½, 4, and 5-inch Whistles, Iron Branch, each " 3½, 4, " 5 " " Brass " " 66.00
 40.00 66.00

| Number 3 | |
|---|------------------------------|
| Size of Pipe | |
| Price, one 5, 6, and 8-inch Whistles, I 5, 6, " 8 " B | ron Brancheach 109.00 160.00 |

| | | N | um | ber | 31 |
|------|-------|---|----|-----|----|
| | _ | | | | _ |

| Size of I | Pipe | | | | | inches | 3 |
|-----------|---------|--------|-------|-----------|-------|---------------------------------------|--------|
| Compose | ed of s | specia | llong | Whistles, | Iron | Branch,each | 130.00 |
| •• | ** | ** | ** | ** | Brass | · · · · · · · · · · · · · · · · · · · | 190.00 |

NOTICE. - Whistle Valves for above are extra, and Chimes will be sent complete with alve, unless otherwise ordered.

AUSTIN CAST IRON STEAM SEPARATORS

ADAPTED FOR EITHER LIVE OR EXHAUST STEAM

STANDARD PATTERNS





Austin Steam Separators: for eliminating water from live steam; for extracting oil and impurities from exhaust; also for removing oil, grit and other solids from compressed air, gas and porous currents.

FIG. "A"

The Fig. "A" is, without question, one of the most perfect eliminators ever devised for taking water out of live steam, or oil from the exhaust. When installed above the throttle of an engine, with a good steam trap of ample size to fully drain the receiving chamber, it furnishes steam that is better than 99 per cent dry, and in some tests as high as 99.6 has been attained. Since first introduced, there has been no material modification in the design of this machine, which in itself proves the correctness of the principles upon which it is constructed.

FIG. "B"

The principle upon which the Austin Fig. "B" is designed is known as an undershot construction. By this is meant that the steam, after being impinged against a baffle plate, passes around under the baffle plate to the outlet. The main feature contributing to the successful operation of this form of separator is that the baffle plate is not set at right angles to the entering steam current, but is set at an angle so that when the steam is impinged against it the particles of water or oil, as the case may be, rebound at at an opposite angle. This sets up a rotating motion in the steam, bringing the latter in contact with the inside walls of the separator. These walls are heavily corrugated, as is also the surface of the baffle plate, and all corrugations are designed so as to carry the drainage out of and away from the course of the steam.

| Sizeinches | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 |
|---------------------------------------|----------------|--------------|---------------------|--|------------------|---|--|
| Price each Diameter of Flanges inches | | | | 50.00 71/3 | 60.00 | 70.00 | |
| Face to Face, Vertical | 11 | | 13 | 1514 | $163\frac{7}{4}$ | 18 | 91/4 20 |
| Size inches | | | $\frac{13^{1}4}{7}$ | | 10 | $\frac{1814}{12}$ | $\frac{19\frac{14}{4}}{*14}$ |
| Price each Diameter of Flanges inches | | 110.00 11 | | 160.00 $13\frac{1}{2}$ | | $\begin{array}{c} 250.00 \\ 19 \end{array}$ | $\begin{array}{c} 300.0\overline{0} \\ 21 \end{array}$ |
| Face to Face, Vertical | 221/4 203/4 | 2514 2414 | 281/2 | $\begin{vmatrix} 31 & 2 \\ 30 & 4 \end{vmatrix}$ | 37 | $\frac{40!}{36}$ | 39 |

*Fig. "A" not made in 14-inch size.

COCHRANE SEPARATORS

FOR LIVE AND EXHAUST STEAM

VERTICAL.







VERTICAL.

Fig. 572B

Fig. 572C

The Cochrane Separators are designed for use in any service where it is desirable to remove any liquid or solid substances—such as water, oil, grit or dirt, etc., from any gaseous or vaporous currents—such as steam, air, gas, ammonia, etc. Specifically, for taking water out of live or exhaust steam; oil out of exhaust steam; oil, grit, etc., from ammonia currents; water or oil from compressed air: liquid or solid substances out of vapors from evaporators, distilling apparatus, etc., the design and type employed depending upon the pressure and the other conditions of service.

Another very important service in which these separators may be employed is that of delivering dry steam to engine whistles in marine service, so that the signal will be instantaneous instead of delayed until all the water in the line is blown out. Again, they are used for removing moisture from steam supplied to oil burners.

| Sizeinches | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 |
|---|-------|-----------------|-------|-------|-----------|-----------------|----------|
| Diameter of Flangesinches | 61/2 | 71/2 | 814 | 9 | 10 | 101/2 | 11 |
| Face to Face, Horizontal Fig. 572A " | 91/2 | 101/3 | 11 | 12 | 13 | $13\frac{1}{2}$ | 14 |
| Center of Inlet to Bottom, Fig. 572A " | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| Height Over All Fig. 572A " | 271/2 | 287/8 | 3014 | 313/4 | 333/8 | 341/8 | 36⅓ |
| Size of Drip. Horizontal" | 1/2 | 1,5 | 1/2 | 1/6 | 3/4 | 3/4 | 1 |
| Face to Face, Vertical Fig. 572B " 572C " | 181/2 | 19 | 20 | 21 | 22 | 23 | 24 |
| " " " " " 572C " | | | 24 | 26 | 28 | 291_{2} | 31 |
| Size of Drip, Vertical " | 1, | 1/2_ | 12 | 1/2 | 3⁄4 | 34 | _1_ |
| Sizeinches | 6 | - 7 | 8 | 9 | 10 | 12 | |
| Diameter of Flangesinches | 1215 | 14 | 15 | 16 | 171/2 | 20 | |
| Face to Face, Horizontal Fig. 572A " | 1512 | 17 | 19 | 21 | 22 | 25 | |
| Center of Inlet to Bottom, Fig. 572A " | 32 | 34 | 361/2 | 39 | 41 | 45 | |
| Height Over All Fig. 572A " | 401/2 | $43\frac{5}{8}$ | 4717 | 51 | 54 | 6014 | |
| Size of Drip, Horizontal " | 1 ~ | 1′ | 11/4 | 11/4 | 11/2 | 11/2 | |
| Face to Face, Vertical Fig. 572B " | 26 | 27 | 28 | 29 | 30 | 32 | |
| " " " " 572C " | 33 | 35 | 36 | | 40 | 42 | |
| Size of Drip, Vertical " | 1 | 1 | 14 | 11/4 | 11/2 | 11/2 | <u> </u> |

Larger sizes made to order. Prices on application.

PITTSBURGH SEPARATORS

"FORMERLY DETROIT"

FOR LIVE AND EXHAUST STEAM HORIZONTAL VERTICAL





| HO | 70 | DIT | |
|----|----|-----|--|
| | | | |
| | | | |

| 11/2 | 2 | 21/2 | 3 | 31_{2} | 4 | $4\frac{1}{2}$ | 5 |
|------------|--|---|--|---|--|---|---|
| 30.00 | 40.00 | 45.00 | 50.00 | 60.00 | 70.00 | 75.00 | 80.00 |
| | | 71/2 | 814 | 9 | 10 | 101/2 | 11 |
| 61/2 | 61/2 | 91/2 | 10 | 1214 | 121/4 | 141/2 | 141/2 |
| 1/2 3/8 | 1/2 3/8 | 1/2 3/8 | 1/2 3/8 | 3/4 3/8 | 3/4 3/8 | 3/4 3/8 | 3/4 1/2 |
| 6 | 7 | 8 | 10 | 12 | 14 | 16 | |
| 110.00 | 125,00 | 160.00 | 220.00 | 250.00 | 300.00 | 400.00 | |
| | 11 | 15 | 171/2 | 20 | 221/2 | 25 | |
| 171/2 | 1834 | 201/2 | 26 | 3014 | 3414 | 38 | |
| 1 | 1 | 114 | 11/2 | $\frac{11}{2}$ | 2 | 21/2 | |
| | $ \begin{array}{c c} 30.00 \\ $ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | $ \begin{array}{ c c c c c c c c c } \hline 30.00 & 40.00 & 45.00 & 50.00 & 60.00 \\ \hline & & & 71/2 & 81/4 & 9 \\ \hline & 61/2 & 61/2 & 91/2 & 10 & 121/4 \\ \hline & 1/2 & 1/2 & 1/2 & 1/2 & 3/4 \\ \hline & 3/8 & 3/8 & 3/8 & 3/8 & 3/8 \\ \hline & 6 & 7 & 8 & 10 & 12 \\ \hline & 110.00 & 125.00 & 160.00 & 220.00 & 250.00 \\ \hline & 121/2 & 11 & 15 & 171/2 & 20 \\ \hline & 171/2 & 183/4 & 201/2 & 26 & 301/4 \\ \hline \end{array} $ | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ |

VERTICAL

| Size inches | $1\frac{1}{2}$ | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | $4\frac{1}{2}$ |
|-----------------------------|----------------|--------|----------------|--------|--------|--------|----------------|
| Priceeach | 30.00 | 40.00 | | 50.00 | 60.00 | 70.00 | 75.00 |
| Diameter of Flanges* inches | | | 71/2 | 814 | 9 | 10 | 101/2 |
| Face to Face " | 18 | 18 | 221/2 | 221/2 | 263/4 | 263/4 | 3034 |
| Size of Drain | 1/2 | 1/2 | 1/2 | 1/2 | 3/4 | 34 | 34 |
| " " Water Gauge " | 3/8 | 3/8 | 3 8 | 3/8 | 3.8 | 3/8 | 3 8 |
| Size inches | 5 | 6 | 7 | 8 | 10 | 12 | |
| Priceeach | 80.00 | 110.00 | 125.00 | 160.00 | 220.00 | 250.CO | |
| Diameter of Flanges inches | 11 | 121/2 | 14 | 15 | 171/2 | 20 | |
| Face to Face " | 3034 | 341/2 | 39 | 44 | 49 | 54 | |
| Size of Drain" | 3/4 | 1 | 114 | 114 | 2 | 2 | |
| " " Water Gauge " | 3/8 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | |

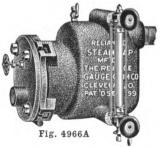
^{*}Sizes 11/2 and 2-inch, screwed only.

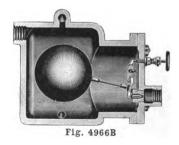
STEAM TRAPS

EXTERIOR

RELIANCE

SECTIONAL.





The entire internal mechanism can be taken out by removing cap from end of trap. A water gauge is provided for, and may be used or not, according to the wishes of the user. It will often be found convenient, as by its use it can be ascertained whether the trap is doing its work perfectly.

When a trap will be required to work under less than 30 pounds pressure, state so

in order, so that the large valve outlet of a low pressure trap may be used

| in order, to that the large variety of the present trap and to discu. | | | | | | | | | |
|---|------|------|------|---------|-------------|-------|--|--|--|
| Size | 1 | 2 | 3 | 4 | 5 | 6 | | | |
| Priceeach | | | | | | | | | |
| Capacity, Lineal Feet of 1-inch Pipe | 1000 | 3000 | 4500 | 7500 | 11000 | 16000 | | | |
| Discharge per Minute pounds | 4 | 7 | 10 | 25 | 40 | 60 | | | |
| Discharge per Minute pounds Size of Pipe Connectionsinches | 1/2 | 34 | 1 | 1^{1} | 1^{1}_{2} | 2 | | | |

EXTERIOR

STRONG BUCKET TYPE SECTIONAL



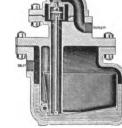


Fig. 4966C

Fig. 4966D

| Number | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------------------|-------|-------|-------|-------|----------------|-------|--------|
| Priceeach | 20.00 | 22.00 | 28.00 | 35.00 | 50.00 | 70.00 | 130.00 |
| Capacity, Lineal Feet of 1-inch Pipe | 3900 | 6000 | 8400 | 15600 | 24300 | 38700 | 100000 |
| " Square Feet of Radiation | | | 2800 | 5200 | 8100 | 12900 | 40000 |
| " Pounds of Water per Hour | 400 | 600 | 850 | 1600 | 2500 | 4000 | 12000 |
| Size of Pipe Connectionsinches | | | 1 | 11/4 | $1\frac{1}{2}$ | 2 | 3 |

We furnish at the same prices for different pressures, as follows:

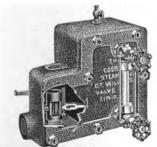
copper gaskets. No rubber or asbestos gaskets used in its construction. The most accessible valve and seat in any trap on the market. Removing the cap exposes both valve and seat. One trap can be fitted for any pressure, from 0 to 250 pounds.

STEAM TRAPS

LOW PRESSURE

COOKSON

HIGH PRESSURE



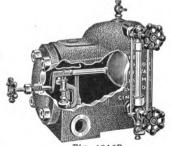


Fig. 4846A COOKSON LOW PRESSURE-For Pressures up to 30 pounds

| Number | 1 | 2 | 3 | 4 | 5 | 6 |
|---|-----|-----|------|------|------|------|
| Price each Capacity per Hour, 3 pounds pressure gallons Inlet and Outlet inches | 600 | 950 | 1500 | 2600 | 3100 | 3700 |

COOKSON HIGH PRESSURE-For Pressures up to 200 pounds 9 6 1 3 5 Number..... 20.50 28.0035.00 50.00 22.50 70.00 Capacity, Lineal Feet of 1-inch Pipe...... 18000 29980 45000 60840 77400 95400 Square Feet of Direct Radiation.... 6000 9960 15000 20280 25800 31800 Water per Minute.....pounds 50 125 265 80 170 215



Inlet and Outletinches





114

1

11/2

2

Fig. 4846C

Fig. 4846D

Fig. 4846E

| Number | | 2 | 3 | 4 | 5 |
|--------------------------------------|----------------------|---------------------|--------------------|-------|-------|
| Price, Class B and Ceach | 16.00 | 20.00 | $27.\overline{50}$ | 42.50 | 70.00 |
| " Sidelug " | 16.85 | 21.30 | 29.25 | 45.50 | 74.75 |
| Size Pipe Connectionsinches | 1/2 | ³ 4 5 | 1 | 114 | 11/2 |
| Discharge per Minutepounds | $\mathbf{\tilde{2}}$ | | 8 | 12 | 20 |
| Capacity, Lineal Feet of 1-inch Pipe | 1050 | 2700 | 4200 | 6000 | 10500 |
| " Square Feet of Direct Radiation | 350 | 900 | 1400 | 2000 | 3500 |

Class B are designed for low pressure service, not exceeding 20 pounds pressure.

Class C are designed for medium service for pressures between 20 and 70 pounds.

The Sidelug trap embodies the Nason principles, is heavier in construction and in addition has extension lugs over the inlet and outlet ports to obviate the blowing

out of gasket at these points. For pressures between 40 to 150 pounds.

STEAM TRAPS

STERLING

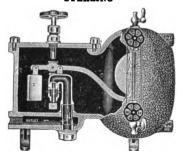


Fig. 9072A

HAINES IMPROVED (HEINTZ) COVER REMOVED

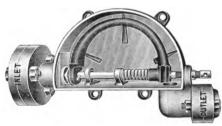


Fig. 9072B

STERLING

The illustration shows quick removable mechanism—without breaking pipe connections. Works at any pressure, equipped with Sterling indestructible float.

A glance will suffice to show the simplicity of construction. A counter-balanced float (1) operates vertical valve (4) hung on rods from float lever by unscrewing nut (5) the whole internal mechanism can be lifted out at once, through flange opening. All parts interchangeable.

Made in three series, as described below, to enable the purchaser to determine at a glance the trap that will suit his particular pressure.

| Number, Series No. 1 | *1 | 2 | 3 | 4 | 5 | 6 |
|---|---------|-------|-------|-------|-------|--------|
| Number, Series No. 2 | 21 | 22 | 23 | 24 | 25 | 26 |
| Number, Series No. 3 | | 32 | 33 | 34 | 35 | 36 |
| Pipe Connectionsinches | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 |
| Condensation per Hour, Series No. 1. pounds | 1800 | 3200 | 4800 | 6400 | 9000 | 14000 |
| " " " " 2" | 1600 | 2700 | 4000 | 5500 | 7000 | 12000 |
| " " " " 3 " | | 2700 | 4000 | 5500 | 7000 | 8500 |
| Capacity Lineal Feet, 1-inch Pipe, Series No. 1 | 3300 | 5300 | 9200 | 13000 | 20000 | 35000 |
| | 3000 | 5000 | 8500 | 12000 | 18000 | 30000 |
| " " 1 " " " 3 | | 5000 | 8500 | 12000 | 18000 | 25000 |
| Weight, Series Nos. 1 and 2pounds | 70 | 85 | 95 | 105 | 120 | 165 |
| " " No. 3 " " | | 100 | 115 | 130 | 150 | 175 |
| Price, Series Nos. 1 and 2each | 22.50 | 27.00 | 33.00 | 48.00 | 60.00 | 96.00 |
| | | 38.00 | 50.00 | 65.00 | 80.00 | 100.00 |

^{*}Series No. 1, pressure 0 to 30 pounds, No. 2, 0 to 150 pounds and No. 3, 0 to 225 pounds.

HAINES IMPROVED (HEINTZ)

Starts wide open at any pressure. Is compact and needs no attention, hence can be installed in inaccessible places. Will not freeze, therefore can be set up anywhere, regardless of climate. A strong point.

Valve seat and head are made of a special grade of bronze and will outlast several ordinary valves. All parts accessible. You do not have to break pipe connections to inspect the trap. Simply remove the lid and all working parts are before you.

| Number | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---------------------------------------|------|-------|-------|------------|-------|-------|-------|-----------|-----------|
| Size of Valves inches | | 3 3 | 1/2 | 5 <u>ś</u> | 34 | 1 | 114 | 11/2 | 2 |
| *Capacity of 1-inch Pipefeet | 500 | 1000 | 3000 | | | | | | 70000 |
| Pipe Connections, inches | 1/2 | 1/2 | 3/1 | 34 | 1 | 114 | 11/2 | 11/2 or 2 | 2 or 21/5 |
| Pipe Connections inches Price each | 8,00 | 11,00 | 17.00 | 25.00 | 32.00 | 40.00 | 55.00 | 70.00 | 90.00 |

^{*}Normal conditions.

NIAGARA WATER METERS

(Potented)





Fig. 7019A

Fig. 7019B

The measuring chamber of the "Niagara" meter is made of the best bronze and is cast and machined in halves. It rests upon a seat formed in a base, and upon opening the meter at the bolted flanges it may be at once removed. It may also be slightly rotated upon its seat so as to cover more or less of the outlet in the base, and thus regulate the meter for unusual water pressures. The disc which works within the chamber is made of hard rubber of such composition that it is nearly buoyant in water, thus securing the greatest sensitiveness to flows with least friction and wear. In order to maintain this advantage, the disc is not loaded with reinforcements or extra parts of any kind that might increase its weight, wear or liability of disarrangement. The requisite strength and durability is secured by making the central ball large to provide ample bearing surface, and by making the flat web extra thick and strong.

The entire outside casing is galvanized and tested for leaks and other defects to a hydrostatic pressure of 300 pounds per square inch. All sizes and styles from $\frac{5}{8}$ to 2 inches included are made with male spuds to receive brass union couplings.

The gears and gear plates are alike and interchangeable in all styles of $\frac{5}{8}$, $\frac{3}{4}$ and 1 inch, as are the larger gears and gear plates in the $1!_4$, $1!_2$, and 2-inch meters.

The submerged or intermediate gears are supported on jewel bearings, which increase the accuracy and durability of the meter.

| Sizeinches | 5/8×1/2 | 5 8x34 | 34 | 1 | $\overline{1}_{4}$ | $1\frac{1}{2}$ | 2 |
|--|----------------|-----------------|------|----------------|--------------------|-----------------|-------|
| Priceeach | 10.70 | | | 21.35 | | 46.70 | 66.70 |
| " Brass Couplings per set | .70 | 1.00 | 1.00 | 1.35 | 2.00 | 2.50 | 3.35 |
| Greatest Proper Capacity per minute cubic feet | 3 | 3 | 5 | 8 | 12 | 20 | 32 |
| Iron Pipe Size of Couplings inches | 1/2 | 34 | 34 | 1 | 1!4 | 11/2 | 2 |
| Height | $6\frac{1}{2}$ | 6^{1}_{2} | 634 | $7\frac{1}{2}$ | 1014 | 11 | 121/2 |
| Width " | 6 | 6 | 7 | 8 | 101 | 1234 | 15 |
| Length, Meter only " | 73/8 | 73/8 | 9 | 101/2 | 13 | 151/2 | 1811 |
| " including Couplings " | 121/2 | $12\frac{1}{2}$ | 14 | 16 | 181/2 | $21\frac{1}{4}$ | 241/2 |
| Weight, Boxedpounds | 15 | 15 | 20 | 30 | 60 | 100 | 150 |

 $\frac{5}{4}$ -inch Meters furnished for either $\frac{1}{2}$ or $\frac{3}{4}$ -inch pipe.



WATER METERS

KING DISK METER



Fig. 6718A

UNION ROTARY PISTON METER



Fig. 6718B

KING DISK METERS

| Size | SAFE DELIVERY | , PER MINUTE | | | | |
|--------|---------------|--------------|--------|-------------|------------------------|--|
| Inches | Cubic Feet | Gallons | Meters | Connections | Register Extensions | |
| 5/8 | 3 | 20 | 8.00 | .40 | 1.50 | |
| 3/4 | 4 | 30 | 12.00 | .60 | 1.50 | |
| 1 | 8 | 60 | 16.00 | .80 | 1.50 | |
| 11/2 | 12 | 90 | 30.00 | No Charge | 2.00 | |
| 2 | 20 | 150 | 50.00 | " " | 2.00 | |

The King Disk Meter is designed to meet the demand for accurate, reliable water meters of the disk type, which will give high efficiency in hard, continuous service. Strong, simple and substantial, its durability and uniformity of registration under

varying rates of flow are unsurpassed.

In its design, especial attention has been given to convenience of arrangement, generously proportioned bearing surfaces and constructional simplicity.

UNION ROTARY PISTON METERS

| Size | | | | PRICE, EACH | | |
|------------|---------|-------|---------|------------------------|--------------------------|------------------------------|
| Inches | Meters | Conne | ections | Register Extensions | Sediment Intercepters | Water Pressure Regulators |
| 5/8 | 12.00 | | 40 | 1.50 | 5.00 | |
| 5/8 3/4 | 18.00 | | 60 | 1.50 | 5.00 | |
| 1 | 25.00 | | 80 | 1.50 | 5.00 | |
| 11/2 | 40.00 | No C | harge | 2.00 | 6.00 | |
| 2 | 60.00 | 44 | ** | 2.00 | 8.00 | |
| 3 | 100.00 | 66 | 44 | 2.00 | 12.00 | |
| 4 | 200.00 | 44 | 44 | 3.00 | 15.00 | 275.00 |
| 6 | 450.00 | 66 | 46 | 3.00 | 25.00 | 425.00 |
| 8 | 750.00 | 66 | 44 | 3.00 | | 550.00 |
| 10 | 1000.00 | 44 | 44 | 3.00 | | 675.00 |
| 12 | 1250.00 | 44 | 44 | 3.00 | | 825.00 |

The Union Rotary Piston Meter derives its name from its fundamental principal; the rotation of two pistons on vertical axes. These pistons, mutually controlled in their respective chambers by means of elliptical gears, constitute the entire measuring mechanism of the meter. A simple gear train transmits their motion to the register.

The construction of the Rotary Meter allows practically uninterrupted flow of water, and the action of the pistons being continuous and positive, accurate measurement

with a minimum of retardation is insured.

WORTHINGTON METERS

DISC WATER METER







Fig. 2128A

Fig. 2128B

DISC WATER METERS

The Worthington Disc Meter combines minimum weight with reliability on constant service and accuracy of registration. All parts, being made to gauge, are interchangeable. A water-balanced disc is employed, thereby reducing wear to a minimum.

A water-balanced disc is employed, thereby reducing wear to a minimum.

In all sizes the pipe openings are on the lower casting. An interior strainer protects the gearing and measuring chamber, being a part of the regular construction in all sizes. Every meter is accurately calibrated in the works before shipment. Unless otherwise specified, standard straight couplings are furnished with the first three sizes, but no couplings are furnished with larger sizes unless specially ordered. Sample meters for test and trial are furnished to water works departments where desired.

| | GALLONS OVER ALL DIMENSIONS | | GALLONS PER MINUTE | | DIMENSIONS | | | | | LONS INUTE | | OVER AL | | |
|--------------------|------------------------------|-------------------------------|--|--|--------------------------------|---------------|---|------------------------------|-------------------------------|---------------|----------------------------|----------------------------|---------------|--|
| Sixe | Nor- mal Capa- city | Maxi- mum Capa- city | | Height Inches | | Price Each | | Nor- mal Capa- city | Max- imum Capa- city | | Height Inches | | Price Each | |
| 3 | 12 24 | 15 30 | 73 s | 65 s 73 | 6 | •••• | 3 | 115 | 150 270 | 14 24 | $\overline{\frac{10}{13}}$ | 123/8 | •••• | |
| 1 | 48 | 60 | 107% | 734 | $\frac{73}{8}$ | • • • • | 4 | 200 400 | 540 | 29 | 1512 | $\frac{18}{23\frac{1}{2}}$ | •••• | |
| $rac{1!_4}{1!_2}$ | 60 70 | 75 90 | $\begin{vmatrix} 11\frac{1}{2} \\ 12^{5} \\ 8 \end{vmatrix}$ | $\begin{vmatrix} 8^{1}4 \\ 9^{1}4 \end{vmatrix}$ | $\frac{8^34}{10! \frac{2}{2}}$ | | 6 | 700 | 900 | 36 | 19 | 30 | •••• | |

OIL METERS-Duplex Piston Pattern

For measuring crude oil, petroleum and naphtha from and into tanks, and for recording the amount of oil used in connection with oil-burning apparatus, special oil meters are furnished, fitted with adjustable tappets in the cylinder heads for regulation of plunger stroke. This admits of exact calibration of the meter for varying services. The cylinders are provided with air cooks at the top, which should be opened at intervals, when the meters are worked on such fluids as naphtha, benzine, kerosene, etc., to release any gas which may collect in the meter. These meters are usually fitted with a large vertical counter as shown in the illustration. The dial has two long hands registering on a circle outside of the main counter. These may be returned to zero at any time without interfering with the progressive registration of the counter. When required, horizontal counters are furnished.

| Size of Openinginches | *14 | 5/8 | 3/4 | 1 | 113 | 2 | 3 | 4 | 6 |
|--|-----|-----|-----|----|-----|----|---|-----|---|
| Capacity per Min. on Constant Service, gals. | | | 8 | 12 | 16 | 20 | | 175 | |
| Priceeach | | | | | | | | | |

^{*}The 1/4-inch size is made only with horizontal counter.

ERIE CITY FEED WATER HEATERS

COUNTER-CURRENT TYPE
WITH CASING REMOVED



Fig. 6083A

Prices on application.

ERIE CITY FEED WATER HEATERS

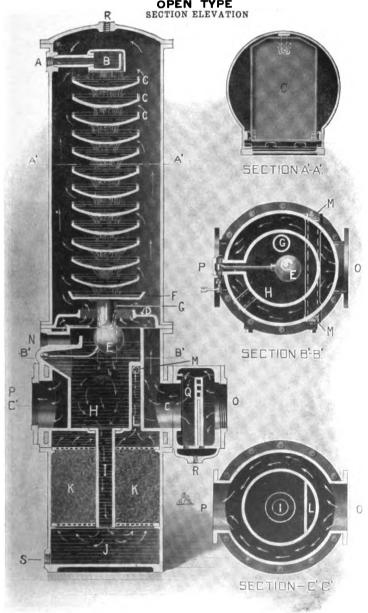


Fig. 6088A

Prices on application.

HOPPES EXHAUST STEAM FEED-WATER HEATERS AND PURIFIERS

STANDARD STEEL CONSTRUCTION HEATER

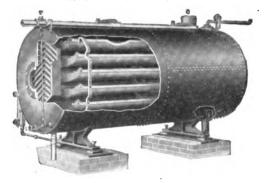


Fig. 7930A CLASS "R" HEATER, CAST IRON CONSTRUCTION

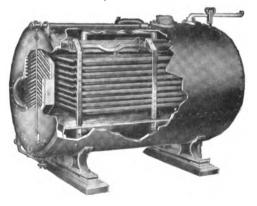


Fig. 7930B

LIVE STEAM FEED-WATER PURIFIER

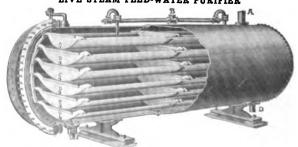


Fig. 7930C

HOPPES EXHAUST STEAM FEED-WATER HEATERS AND PURIFIERS

Are designed in accordance with the best engineering practice and bring the water into direct contact with the steam in thin films on a large heating and line-catching surface, giving the highest possible temperature and the greatest degree of purification obtainable from exhaust steam.

The method of operation is very simple. The water enters the feed pan at the top of the shell through the inside branches from the main feed-pipe. Overflowing the edges of each pan successively, owing to the peculiar trough shape of the pans, it follows the under sides to the lowest point before dropping to the next pan below, thus keeping the water constantly in contact with the steam in a thin film and giving it a long course of travel, both of which are conducive to the best possible results and in fact, are the most essential requisites.

Each Heater is also provided with an efficient Oil Extractor and Automatic Reguulating Valve for controlling the feed-water supply.

Write for prices and blue prints, stating horse power of boiler plant.

HOPPES LIVE STEAM FEED-WATER PURIFIERS

Keep boilers clean without the use of chemicals and act as reservoirs of energy to help over "peak loads." They operate on the same general principle as the Exhaust Heater, only the high temperature of the live steam makes the purification of the feedwater more complete. No expense after installation.

Special catalogues and prices furnished on application.



COCHRANE FEED WATER HEATERS

HEATER AND PURIFIER TYPE

FOR USE WITH ENGINES AND PUMPS EXHAUSTING FREELY TO THE ATMOSPHERE

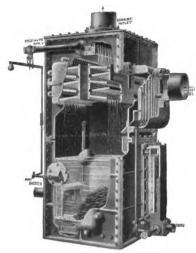


Fig. 6035A

The Cochrane Feed Water Heaters now in use are earning on an average over 200 per cent annually on their first cost, figuring on the heat saved alone and without counting the value of water saved or reductions in boiler cleaning and repair bills. Cochrane Feed Water Heaters find profitable use practically wherever there is steam, as in textile mills, dye houses, ice plants, rolling mills, paper mills, roundhouses, heating systems, laundries, condensing power plants, non-condensing power plants, using hard water, acid water, etc., etc.

Where the main engine exhausts to atmosphere, the Cochrane Heater will recover heat from the exhaust steam and use it in heating the feed water, to the extent of about 15 per cent of the coal bill. Under such circumstances it will usually pay for itself in less than six months, and at the same time, by improving the quality of the boiler feed supply, it will reduce the boiler cleaning bills. Again, by preventing the strains caused in boilers by cold water, it will reduce the number of cases of leaky tubes and will, both by reason of this and the prevention of scale, diminish the danger of steam boiler operation.

A Cochrane Heater receives cold water and exhaust steam and delivers boiling hot water that may safely be used for feeding boilers or for other purposes; that is, water free from oil and improved in quality, no matter how bad originally. The mixture of the exhaust steam with the water heats the water to practically the full temperature of the steam, so that when the heater is kept filled with steam the temperature of the water leaving the heater is generally about 210° without back pressure. For every 10° added to the temperature of the feed water by means of exhaust steam theoretically about .9 of 1 per cent of the fuel will be saved. As a matter of fact, the saving actually averages one per cent for every 8° or 9° added to the temperature of the feed water in the heater, or from 1.2 to 1.4 per cent for each 10° rise.



EXHAUST PIPE HEADS

BURT



CHAMPION

SWARTWOUT Cast Iron









Fig. 842B

Fig. 842C

Fig. 842D

BURT

| Size of Exhaust Pipe inches | 1 or 1½ | 2 or 21/2 | 3 or 31/2 | 4 or 41/2 | 5 | 6 |
|-----------------------------|---------|-----------|-----------|-----------|--------|--------|
| Priceeach | 8.00 | 10.00 | 12.00 | 16.00 | 20.00 | 24.00 |
| Size of Exhaust Pipe inches | 7 | 8 | 9 | 10 or 11 | 12 | 13 |
| Priceeach | 30.00 | 36.00 | 42.00 | 50.00 | 60.00 | 70.00 |
| Size of Exhaust Pipe inches | 14 | 15 | 16 | 17 | 18 | 20 |
| Priceeach | 80.00 | 94.00 | 100.00 | 108.00 | 120.00 | 144.00 |

Burt Exhaust Heads 5 inches and larger have companion flanges.

LYMAN

| Size of Exhaust Pipeinches | 1 to 1½ | 2 or 212 | 3 or 3½ | 4 or 41/2 | 5 | 6 |
|-----------------------------|---------|----------|---------|-----------|----------|--------|
| Priceeach | 20.00 | 25.00 | 30.00 | 40.00 | 50.00 | 60.00 |
| Size of Exhaust Pipe inches | 7 | 8 | 9 | 16 | 11 or 12 | 13 |
| Priceeach | 75.00 | 90.00 | 105.00 | 125.00 | 150.00 | 175.00 |
| Size of Exhaust Pipe inches | 14 | 15 | 16 | 17 | 18 | 20 |
| Priceeach | 200.00 | 235.00 | 250.00 | 270.00 | 300.00 | |

Lyman Exhaust Heads, 41/2 inch and smaller, screwed; larger, flanged.

CHAMPION

| Size of Exhaust Pipeinches | 1 or 1½ | 2 or 2½ | 3 or 31/2 | 4 or 41/2 | 5 | 6 | 7 |
|-----------------------------|---------|---------|-----------|-----------|--------|--------|--------|
| Priceeach | 20.00 | 25.00 | 30.00 | 40.00 | 50.00 | 60.00 | 75.00 |
| Size of Exhaust Pipe inches | | 9 | | 11 or 12 | | | |
| Price each | 90.00 | 105.00 | 125.00 | 150.00 | 200.00 | 250.00 | 300.00 |

Champion Exhaust Heads, 6 inch and smaller, screwed: larger, flanged.

SWARTWOUT, CAST IRON-Patented

| Size of Exhaust Pipe inches | 1 or 11/6 | 2 or 21.5 | 3 or 31 5 | 4 or 416 | 5 | 6 |
|-----------------------------|-----------|-----------|-----------|----------|--------|---------|
| Priceeach | 20.00 | 25.00 | 30.00 | 40.00 | 50.00 | 60.00 |
| Size of Exhaust Pipe.inches | 7 | 8 | 10 | 12 | 14 | 16 |
| Price each | 75.00 | 90.00 | 125.00 | 150.00 | 200.00 | -250.00 |
| Size of Exhaust Pipe inches | 18 | 20 | 22 | 24 | 30 | 36 |
| Priceeach | 300.00 | 360.00 | 450.00 | 600.00 | 900.00 | 1200.00 |

Swartwout Exhaust Heads, 5 inches and smaller, screwed; larger, flanged.

PENBERTHY INJECTORS

AUTOMATIC

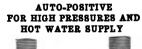




Fig. 814A



Fig. 814B

AUTOMATIC INJECTORS

| Size | Price Each | Horse-Power Based on Ordinary Tubular Boiler | Horse-Power Based on 30 lbs. Water Per Horse Power | Pipe Connections Inches | CAPACITYGALI 1 to 3 ft. Liit, Steam F | 60 to 110 lbs. | | | | | | | | |
|------------------------|------------|---|--|--|---|----------------|--|--|--|--|--|--|--|--|
| |] | Tubilar Boller | Per Hour | | Maximum | Minimum | | | | | | | | |
| 0 | 15.00 | 3 to 6 | 4 to 8 | 1/4 | 60 | 35 | | | | | | | | |
| 00 | 16.00 | 4 " 8 | 6 " 12 | 3/8 | 80 | 45 | | | | | | | | |
| A | 18.00 | 8 " 16 | 10 " 20 | 1/2 | 135 | 70 | | | | | | | | |
| $\mathbf{A}\mathbf{A}$ | 20.00 | 12 " 22 | 15 " 30 | 1/2 | 180 | 100 | | | | | | | | |
| ${f B}$ | 25.00 | 17 " 32 | 22 " 45 | 3√ 3 − 1 | 260 | 140 | | | | | | | | |
| $\mathbf{B}\mathbf{B}$ | 30.00 | 20 " 45 | 25 " 60 | 1/4 3/8 1/2 1/2 3/4 3/4 | 360 | 180 | | | | | | | | |
| \mathbf{c} | 40.00 | 40 " 65 | 45 " 80 | 1 | 475 | 250 | | | | | | | | |
| CC | 45.00 | 45 " 80 | 50 " 100 | 1 | 600 | 325 | | | | | | | | |
| D | 55.00 | 50 " 100 | 60 " 135 | 11/4 | 800 | 425 | | | | | | | | |
| $\mathbf{D}\mathbf{D}$ | 60.00 | 75 " 135 | 85 " 1 65 | 11/4 | 1000 | 525 | | | | | | | | |
| E | 75.00 | 100 " 180 | 125 " 2 35 | 11/3 | 1400 | 740 | | | | | | | | |
| $\mathbf{E}\mathbf{E}$ | 90.00 | 115 " 255 | 150 " 320 | 11/3 | 1900 | 850 | | | | | | | | |
| F | 110.00 | 160 " 320 | 200 " 400 | 2 2 | 2400 | 1275 | | | | | | | | |
| \mathbf{FF} | 125.00 | 200 " 400 | 250 " 500 | $\begin{bmatrix} 11\frac{1}{2} \\ 11\frac{1}{2} \\ 2 \\ 2 \end{bmatrix}$ | 3000 | 1600 | | | | | | | | |
| G | 150.00 | 300 " 500 | 325 " 600 | 21/2 | 3600 | 1875 | | | | | | | | |
| ĞG | 200.00 | 375 " 600 | 400 " 750 | $2i\frac{7}{2}$ | 4200 | 2150 | | | | | | | | |

AUTO-POSITIVE INJECTORS

| Number | Price Each | Horse Power Allowing 7½ to 8 gals per HP. | Ртр | E CONNECTI INCHES | CAPACITY PER HOUR 75 to 125 lbs. Steam, 3 ft. Lift, Gallons | | |
|--------|---------------|---|-------------------|----------------------|---|----------|------|
| | | Per Hour | Steam | Suction | Maximum | Minimum- | |
| 112 | 18.00 | 5 to 15 | 3/8 | 3/8 | 3/8 | 120 | 40 |
| 113 | 20.00 | 7 " 25 | 3/8 1/2 3/4 | 3/8 1/2 3/4 | 1 12 | 200 | 60 |
| 115 | 30.00 | 16 " 50 | 3.4 | 34 | 3/4 | 400 | 130 |
| 117 | 45.00 | 28 " 85 | 1 | 1 | 1 | 675 | 225 |
| 119 | 60.00 | 47 " 145 | 11/4 | 114 | 11/4 | 1125 | 375 |
| 121 | 90.00 | 87 " 265 | 11/2 | 11/2 | 11/2 | 2000 | 700 |
| 123 | 125.00 | 125 " 400 | 2 | 2 | 2 | 3000 | 1000 |
| 125 | 200.00 | 200 " 600 | 21/2 | $2\frac{1}{2}$ | 21/2 | 4200 | 1500 |

PENBERTHY INJECTOR REPAIR PARTS



AUTO-POSITIVE

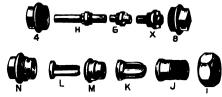


Fig. 4819B

AUTOMATIC

| Size Injector | 00 | A A A | B BB | $\begin{array}{c} \mathbf{C} \\ \mathbf{CC} \end{array}$ | D D D | Е | EE | F | FF | $\frac{\mathbf{G}}{\mathbf{G}\mathbf{G}}$ |
|--|---|------------|---|--|---|---|---|--|--|---|
| R—Steam Jet each S—Suction Jet Y—Delivery Jet X—Coupling Nut V—Tail Pipe Z—Overflow Cap P— Valve N— Hinge O—Plug | .25 .25 1.25 .25 .25 .30 .40 .10 | .10 .80 | .45 .45 2.00 .40 .40 .50 .60 .15 | .55 .55 2.50 .50 .50 .60 .75 .15 | .65 .65 3.00 .60 .60 .70 .90 .15 | .75 .75 3.75 1.25 .80 .80 1.00 .20 | .75 .75 4.50 1.25 .80 .80 1.10 .20 1.75 | .85 .85 5.50 1.50 1.00 .90 1.25 .20 2.00 | 1.00 1.00 6.50 1.50 1.00 .90 1.25 .20 2.00 | 2.00 3.00 9.00 2.00 1.25 1.50 1.75 .30 4.00 |
| Strainer " | .40 | . 45 | .50 | .55 | .60 | .75 | . 75 | 1.00 | 1.00 | 1.50 |

Extra parts can be furnished for all Automatic Injectors numbered above 21000 without need of returning same to factory.

In ordering parts do not fail to give serial letter and number of injector.

In referring to or ordering parts, designate them by letter or name as per above.

AUTO-POSITIVE

| Size Injector | 112 | 113 | 115 | 117 | 119 | 121 | 123 | 125 |
|-------------------------|------|------|------|------|------|------|------|------|
| 8—Steam Plugeach | . 70 | .80 | .80 | .90 | 1.10 | 1.40 | 1.70 | 2.50 |
| X— " Jet " | .40 | .50 | .60 | .75 | .90 | 1.00 | 1.20 | 2.00 |
| G-Suction Jet " | .30 | .40 | . 50 | .60 | .75 | .85 | 1.00 | 1.50 |
| H-Delivery " " | .90 | 1.00 | 1.50 | 2.00 | 3.00 | 4.00 | 5.50 | 8.00 |
| 4— " Plug " | .60 | .70 | .80 | .90 | 1.10 | 1.40 | 1.70 | 2.50 |
| N—Overflow " " | . 75 | .80 | 1.00 | 1.25 | 1.50 | 1.75 | 2.00 | 3.00 |
| L-Pressure Valve " | .25 | .30 | . 45 | .60 | .75 | 1.00 | 1.25 | 2.00 |
| M- " Collar " | .30 | .40 | .60 | .90 | 1.25 | 1.75 | 2.25 | 3.00 |
| K-Vacuum " " | .25 | .30 | .45 | .60 | . 75 | 1.00 | 1.25 | 1.75 |
| I—Coupling Nut " | .25 | .30 | .40 | .50 | .60 | 1.25 | 1.50 | 2.00 |
| J-Tail Pipe " | .25 | .30 | .40 | .50 | .60 | .80 | 1.00 | 1.25 |
| Strainer " | . 40 | .45 | .50 | .55 | .60 | .75 | 1.00 | 1.50 |
| Tool for Removing Jet " | . 45 | .50 | .60 | .70 | .80 | .90 | 1.00 | 1.50 |

In ordering parts give size number; also, if possible, shop number of injector.

PENBERTHY AUTOMATIC INJECTORS

SPECIAL CONNECTION INJECTORS

NON-LIFTING For Water Pressure



Fig. 4805A

Left and Right Suction Left. Overflow Front Discharge Right



Fig. 4805B

Right and Left Suction Right. Overflow Front Discharge Left



Fig. 4805C

FOR WATER PRESSURE

| Number | Price Each | Pipe Connections | Capacity Gallons Per Hour 10 to 175 Pounds Steam Pressur | | | |
|-------------|------------|---------------------|---|---------|--|--|
| | | Inches | Maximum | Minimum | | |
| 126 | 16.00 | 3/8 | 90 | 60 | | |
| 12 8 | 20.00 | 1/2 | 175 | 110 | | |
| 130 | 30.00 | 3/4 | 375 | 200 | | |
| 132 | 45.00 | i i | 600 | 375 | | |

Non-Lifting Injectors will start at from 3 to 5 pounds steam pressure where water is taken from a barrel or tank at or just above the level of the Injector. With Water Pressure of 20 pounds, they will start at from 10 to 12 pounds low steam and work up to 175 pounds high pressure.

Owing to the demand for an Injector for low pressure for steam heating plants etc we are prepared to furnish above sizes corresponding to OO, AA, BB, and CC of the regular Automatic Injectors.

SPECIAL CONNECTIONS

We are prepared to furnish all sizes in styles shown by the special connection, illustrations above as well as in stock patterns as shown on the following page. The style Left and Right is adapted for the right hand side of a boiler; the Right and Left for the left hand side.

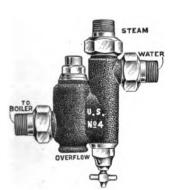
We can also furnish what is known as style Right and Back, having the suction on the opposite side from the stock Injector, also what is known as style Back and Back, having both suction and delivery on the side opposite the overflow. The latter two styles are furnished only in sizes A, AA, B and BB.

The above terms Right and Left. Left and Right, Etc, means suction on right and discharge on left side of Injector, and vice versa, with overflow facing front.

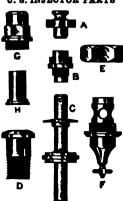
Sizes, Prices and Capacities of special Connection Injectors are the same as regular Automatic Injectors.

U. S. INJECTORS

U. S. INJECTOR



U. S. INJECTOR PARTS



F1g. 649A

U. S. INJECTORS

Fig. 649B

| Number | Price | Horse-Power based on Ordinary | Horse-Power based on 30 lbs. Water | PIP | e Connecti | ons, | CAPACITY Gallons per Hour | | |
|--------|--------|-------------------------------------|--|--------------------------|--------------------------|--------------------|------------------------------|---------|--|
| Nur | Each | Tubular Boiler | per H. P. per hour. | Steam | Supply Inches | Delivery Inches | Maximum | Minimum | |
| 00 | 13.00 | 1 to 3 | 1 to 4 | 1/4 | 1/4 3/8 3/8 3/8 | 1/4 | 36 | 20 | |
| 0 | 14.00 | 3 " 6 | 4 " 8 | 1/4 3/8 | 3/8 | 1/4 3/8 3/8 | 65 | 35 | |
| 1 | 16.00 | 4 " 8 | 6 " 12 | 3/8 1/2 1/4 | 3/8 | 3/8 | 90 | 55 | |
| 2 | 18.00 | 8 " 16 | 10 " 20 | 1/2 | 1/2 | 1/ | 135 | 65 | |
| 3 | 20.00 | 12 " 22 | 15 " 30 | 1/9 | 1/2 | 1/2 | 180 | 100 | |
| 4 | 25.00 | 17 " 32 | 22 " 45 | 1/2 3/4 3/4 3/4 | 1/2 1/2 3/4 3/4 | 3/4 | 260 | 140 | |
| 5 | 30.00 | 20 " 45 | 25 " 60 | 3/4 | 3/4 | 34 | 355 | 170 | |
| 6 | 40.00 | 40 " 65 | 45 " 80 | 1 | 1 | 1 | 475 | 300 | |
| 7 | 45.00 | 45 " 80 | 50 " 100 | 1 | 1 | 1 | 600 | 350 | |
| 8 | 55.00 | 50 " 100 | 60 " 135 | 11/4 | 114 | 11/4 | 800 | 425 | |
| 9 | 60.00 | 75 " 135 | 85 " 165 | 114 . | 11/4 | 11/4 | 1000 | 525 | |
| 10 | 75.00 | 100 " 180 | 125 " 235 | 116 | 11/2 | 11% | 1400 | 800 | |
| 11 | 90.00 | 115 " 255 | 150 " 320 | 11/2 | 11/2 | 11/2 | 1900 | 950 | |
| 12 | 110.00 | 160 " 320 | 200 " 380 | 2 | 2 | 2 | 2400 | 1300 | |
| 14 | 150.00 | 300 " 500 | 325 " 550 | 2 | 2 | 2 | 3600 | 2000 | |

U. S. INJECTOR PARTS

| Size Injector | 00 to No. 3 | 4 and 5 | 6 and 7 | 8 and 9 | 10 and 11 | 12, 13 and 14 |
|------------------------------|-------------------|---------------|---------------|---------------|-----------------|---------------------|
| D-Tail Pipeeach | .30 | .35 | .40 | .50 | . 75 | 1.00 |
| E-Tail Pipe Nut " | .30 | .40 | .50 | .65 | .85 | 1.20 |
| A-Steam Jet " | .80 | 1.00 | 1.15 | 1.35 | 1.60 | 2.00 |
| B-Suction Jet" | .50 | .75 | 1.25 | 1.50 | 1.75 | 2.00 |
| C-Delivery Tube " | 1.00 | 1.10 | 1.45 | 1.75 | 2.00 | 2.50 |
| F-Delivery Cap " | 1.00 | 1.10 | 1.45 | 1.75 | 2.00 | 2.50 |
| G (Overflow Cap and Valve " | .80 | .95 | 1.00 | 1.25 | 1.50 | 2.00 |

In ordering U. S. Injector parts always give size and shop number, specify the parts by the names given above, use no other terms.

METROPOLITAN AUTOMATIC INJECTORS

MODEL N





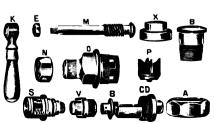


Fig. 4821A

Fig. 4821B

INJECTORS-MODEL N

| Sizes | Price Each | Size of all Pipe Connec- tion, Inches | Size Overflow or Waste Pipe, Inches | Capacity with 80 p'nds Steam Pres- sure, 2-ft. Lift, Gallons | Ordin of | orse-Power for the dinary Type of Boiler nd Engine | | on a Basis of | | |
|-------|---------------|--|--|--|-------------|--|-----|---------------|----|-----|
| 2 | 15.00 | 3/8 | 3/4 | 60 | 4 | to | 6 | 5 | to | 8 |
| 3 | 16.00 | 3/8 | 3/4 | 80 | 6 | 66 | 8 | 8 | 61 | 12 |
| 31/2 | 18.00 | 1/2 | 3/4 | 120 | 8 | 66 | 15 | 12 | 44 | 20 |
| 4 | 20.00 | 1/2 | 3/4 | 165 | 15 | 66 | 20 | 20 | 66 | 28 |
| 5 | 25.00 | 3/4 | 1 | 250 | 20 | " | 30 | 28 | 66 | 40 |
| 6 | 30.00 | 3/4 | 1 | 350 | 30 | " | 45 | 40 | 44 | 55 |
| 7 | 40.00 | 1 | 11/4 | 500 | 45 | 66 | 65 | . 55 | " | 80 |
| 8 | 45.00 | 1 | 114 | 600 | 65 | 66 | 80 | 80 | 66 | 110 |
| 9 | 55.00 | 11/4 | 11/2 | 800 | 80 | 66 | 100 | 110 | ** | 145 |
| 10 | 60.00 | 11/4 | 11/2 | 1000 | 100 | 66 | 130 | 145 | 44 | 180 |
| 11 | 75.00 | 11/2 | 2 | 1300 | 130 | 66 | 170 | 180 | 44 | 235 |
| 12 | 90.00 | 11/2 | 2 | 1750 | 170 | 46 | 230 | 235 | 14 | 300 |
| 13 | 110.00 | 2 | 21/2 | 2300 | 230 | " | 300 | 300 | | 400 |
| 14 | 125.00 | 2 | $21\frac{7}{2}$ | 2850 | 300 | 66 | 375 | 400 | 44 | 500 |

INJECTOR REPAIR PARTS

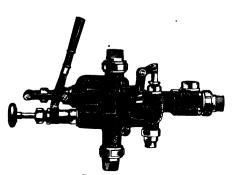
| | | Price, Each | | | | | | | | | | | |
|-------------------|----------------|---------------------|--|------------------------|--------------------|---------------------------------|---------------------|-------------------------------|----------------------|--------------------|----------------------|------------------------|-----------------|
| Slzes | S Steam Jet | V Suction Jet | C.D.R.Combin- ing & Delivery Tube & Auxili- ary Check | P Overflow Valve | O Steam Plug | M Steam Valve and Stem | N Packing Nut | K Steam Valve Handle | A Coupling Nut | B Tull Piece | X Overflow Cap | E Nut for Stem M | Jet Wrenches |
| $\frac{1}{2}$, 3 | 1.50 | .60 | 1.75 | .25 | 1.00 | . 40 | .30 | .60 | .60 | .40 | .50 | .10 | 1.30 |
| 31, 4 | 1.75 | . 70 | 2.10 | .50 | 1.25 | .55 | .40 | | .80 | .55 | .75 | .10 | 1.40 |
| 5, 6 | 2.00 | .90 | 2.75 | . 75 | 1.50 | . 75 | .50 | | 1.20 | .80 | 1.00 | .10 | 1.50 |
| 7, 8 | 2.50 | 1.25 | 3.50 | 1.00 | 2.25 | 1.10 | .65 | 1.00 | 1.65 | 1.20 | 1.25 | . 15 | 1.75 |
| 9, 10 | 3.75 | 1.85 | 4.50 | 1.25 | 3.50 | 1.75 | .80 | 1.20 | 2.40 | 1.70 | 1.75 | . 15 | 2.25 |
| 11, 12 | 5.00 | 3.00 | 6.50 | 1.75 | 5.00 | 2.50 | 1.00 | 1.40 | 3.20 | 2.40 | 2.25 | .15 | 3.00 |
| 13, 14 | 7.00 | 4.00 | 9.00 | 2.50 | 7.00 | 4.00 | 1.25 | 1.60 | 5.00 | 3.40 | 3.00 | .20 | 4.00 |

Always state the size, number of the injector, model letter and serial or factory number.



METROPOLITAN AUTOMATIC INJECTORS

MODEL O



MODEL X



Fig. 7460B

Fig. 7460A

MODEL O

| Sizes | Price Each | Size All Pipe Connec- tions Inches | Size Overflow Pipe Inches | With | With 175 Lbs. Steam Pressure | Horse-Power for Ordinary Type Engine and Boller | Horse-Power on a Basis of 30 Lbs. Evaporation per H. P. per Hour | Price Drip Funnel Each |
|--------------------|---------------|--|------------------------------------|-------------|---------------------------------------|--|---|---------------------------------|
| | 10.00 | · | ' | | 175 | 8 to 15 | | 1.00 |
| 2^{1}_{2} | 18.00 | 1.2 | 1 2 | 130 | | | 12 to 20 | |
| 413 | 20.00 | 32 | 1 2 | 180 | 220 | 10 40 | 20 " 28 | 1 00 |
| 51/4 | 25.00 | | 3/4 | 26 0 | 300 | 20 " 30 | 28 " 40 | 1.00 |
| $6^{1}\frac{5}{2}$ | 30.00 | 34 | 34 | 365 | 415 | 30 " 45 | 40 " 55 | 1.00 |
| 71/2 | 40.00 | 1 | 34 34 34 34 | 525 | 600 | 45 " 65 | 55 " 80 | 1.00 |
| 81, | 45.00 | 1 | 3,1 | 625 | 720 | 65 " 80 | 8 0 " 11 0 | 1.00 |
| 915 | 55.00 | 11. | 1 | 835 | 950 | 80 " 100 | 110 " 145 | 1.25 |
| 1013 | 60.00 | $1^{1\frac{7}{4}}$ | 1 | 1040 | 1195 | 100 " 130 | 145 " 180 | 1.25 |
| 1114 | 75.00 | 11/2 | 114 | 1350 | 1550 | 130 " 170 | 180 " 235 | 1.50 |
| $12^{\frac{1}{2}}$ | 90.00 | 112 | 11/4 | 1600 | 2070 | 170 " 230 | 235 " 300 | 1.50 |
| 1315 | 110.00 | $\begin{vmatrix} 2 \\ 2 \end{vmatrix}$ | 112 | 2350 | 2675 | 230 " 300 | 300 " 400 | 1.75 |
| 1412 | 125.00 | 2 | 112 | 2900 | 3275 | 300 " 375 | 400 " 500 | 1.75 |
| 1513 | 150.00 | 2^{1}_{2} | 2 | 3600 | 3975 | 375 " 500 | 500 " 650 | 2.00 |
| 161, | 200.00 | 212 | 2 | 4300 | 4750 | 500 " 6 50 | 650 " 800 | 2.00 |
| $171\frac{5}{2}$ | 250.00 | 3 | $2\frac{1}{2}$ | 4900 | 5300 | 650 " 800 | 800 " 975 | 2.50 |
| 1812 | 300.00 | 3 | 212 | 5500 | 6100 | 800 "1000 | 975 "1250 | 2.50 |

MODEL X

| | Price | SIZE OF PIP | e Connecti | ons, Inches | Capacity with 65 to 90 pounds | *Horse-Power | †Horse-Power | |
|-----|-------|-------------|------------|-------------|----------------------------------|--------------|--------------|--|
| | Each | Steam | Suction | Delivery | Steam Pressure Gallons | norse tower | Indiae Tower | |
| 20 | 15.00 | 3/8 | 3/8 | 3 | 60 | 2 to 6 | 4 to 8 | |
| 30 | 16.00 | 3% | 3,8 | 3/8 | 80 | 4 " 8 | 6 " 12 | |
| 35 | 18.00 | 1,8 | 1/3 | 1,3 | 140 | 8 " 16 | 12 " 20 | |
| 40 | 20.00 | 1/3 | 1/3 | 1/2 | 190 | 16 " 23 | 20 " 30 | |
| 50 | 25.00 | 3,7 | 3,7 | 3/4 | 270 | 23 " 30 | 30 " 45 | |
| 60 | 30.00 | 3/4 3/4 | 37 | 37 | 370 | 30 " 45 | 45 " 60 | |
| 70 | 40.00 | 1 | 1 | 1 | 490 | 45 " 65 | 60 " 80 | |
| _80 | 45.00 | 1 | 1 | 1 | 620 | 65 " 80 | 80 " 110 | |

^{*}Horse-power for ordinary type Boiler.

[†]Horse-power on a basis of 30 pounds evaporation per horse-power per hour.

KÖRTING UNIVERSAL DOUBLE TUBE INJECTORS

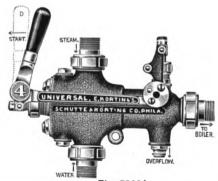


Fig. 7366A

| | Price | | | | CAPAC | CITIES | | | Size of |
|--------|-----------------|--------------------------------|---------|------------------|-----------------|-----------------|-------------------|---------------------|---------|
| Number | Screwed Each | Size of Iron Pipe Inches | | m 50 Pressure | Steam Pounds | 100 Pressure | Steam Pounds I | Copper Pipe O. D | |
| | | menes | Gallons | Н. Р. | Gallons | Н. Р. | Gallons | Н. Р. | Inches |
| 00 | 20.00 | 18 | 33 | 7 | 48 | 10 | 60 | 12 | 1/4 |
| 0 | 21.00 | 1 1 | 83 | 17 | 101 | 20 | 112 | 22 | 3/8 |
| 1 | 23.00 | 3/8 | 112 | 23 | 143 | 30 | 180 | 36 | 1/2 |
| 2 | 28.00 | 1/2 | 172 | 35 | 210 | 40 | 232 | 46 | 5/8 |
| 3 | 38.00 | 34 | 278 | 56 | 338 | 70 | 397 | 80 | 7/8 |
| 31/2 | 38.00 | 3/4 | 398 | 80 | 472 | 95 | 547 | 110 | 7/8 |
| 4 | 50.00 | 1 | 533 | 108 | 622 | 125 | 720 | 150 | 11/8 |
| 5 | 60.00 | 11/4 | 675 | 136 | 802 | 160 | 922 | 190 | 11/2 |
| 6 | 60.00 | 11/4 | 825 | 165 | 990 | 200 | 1125 | 230 | 11/2 |
| 7 | 85.00 | 11/2 | 1072 | 215 | 1372 | 230 | 1612 | 320 | 13/4 |
| 8 | 85.00 | 11/2 | 1388 | 280 | 1800 | 360 | 2115 | 430 | 13/4 |
| 9 | 120.00 | 2 | 1688 | 340 | 2100 | 420 | 2475 | 500 | 21/4 |
| 10 | 120.00 | 2 | 2025 | 400 | 2438 | 500 | 2850 | 570 | 214 |
| 11 | 165.00 | *21/2 | 2530 | 500 | 3050 | 625 | 3515 | 712 | **234 |
| 12 | 165.00 | 21/2 | 3000 | 600 | 3638 | 750 | 4252 | 850 | 23/4 |
| 14 | 250.00 | 3 | 3867 | 780 | 4635 | 930 | 5500 | 1100 | 31/4 |
| 16 | 250.00 | 3 | 5025 | 1000 | 6075 | 1200 - | 7000 | 1400 | 31/4 |
| 20 | 450.00 | 4 | 9000 | 1800 | 10840 | 2200 | 12525 | 2500 | 41/4 |

Takes water at temperature of 150° Fahrenheit, 6 feet suction, 100 pounds steam. If suction exceeds 10 feet vertical, select next larger size.

ATTACHMENTS

| Size of Pipe | nches 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 |
|----------------------------------|-------------|-------|-------|-------|-------|--------|
| Price, Dirt Stops | | | 1.30 | 1.65 | 2.20 | 3.00 |
| " Drip Funnels† | . " .30 | .40 | .40 | .50 | .60 | 80 |
| " Stop Valves | . " 3.75 | 3.75 | 4.25 | 5.00 | 6.75 | 9.50 |
| " Check Valves | . " 2.50 | 2.50 | 3.00 | 3.75 | 5.00 | 6.75 |
| " Water Pressure Balanced Valves | . " | 4.25 | 5.00 | 6.75 | 9.50 | 12.50 |
| Size of Pipei | inches 11/4 | 11/2 | 2 | 21/2 | 3 | 4 |
| Price, Dirt Stops | | 6.25 | 9.50 | 16.00 | 23,00 | 44.00 |
| " Drip Funnels† | | 1.20 | 1.40 | 2.00 | 4.00 | 6.00 |
| " Stop Valves | . " 12.50 | 17.00 | 25.00 | 40.00 | 58.00 | 120.00 |
| " Check Valves | | 14.00 | 21.50 | 36.00 | 52.00 | 100.00 |
| " Water Pressure Balanced Valves | | 0= 00 | 10 00 | FO 00 | 00 00 | 150.00 |

†Sizes of Injectors. *Steam and Discharge 2 inches: Suction 2½-inch. **Steam and Discharge 2¼-inch: Suction 2¾-inch.

HANCOCK INSPIRATORS

STATIONARY TYPE For Stationary and Portable Boilers







Fig. 815A

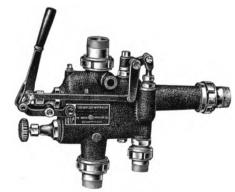


Fig. 815B

STATIONARY TYPE

| | 1 | Horse | Power | Pipe Co | NNECTIONS | , Inches | Capacity, |
|-------|---------------|---|---|----------------|----------------------------|-------------------|--|
| Sizes | Price Each | For the Ordinary Type of Boiler and Engine | On a Basis of 30 Pounds Evaporation per H. P. per Hour | Steam | Suction and Delivery | Overflow | per Hour, with 60 Pounds Steam Pressure Gallons |
| 71/2 | 16.00 | 4 to 6 | 5 to 8 | 3/8 | 3/8 | 14 | 60 |
| 834 | 18.00 | 6 "8 | 8 " 15 | 3/8 | 1/2 | 3/8 | 90 |
| 10 | 20.00 | 8 " 15 | 15 " 25 | 3/8 | 1/2 | 3/8 | 120 |
| 121/2 | 25.00 | 15 " 30 | 25 " 35 | 1/2 | 34 | 1/2 | 220 |
| 15 | 30.00 | 30 " 40 | 35 " 60 | 1/2 | 3/4 | 1/2 | 300 |
| 171/2 | 40.00 | 40 " 60 | 60 " 75 | 34 | 1 | 1/2 3/4 | 420 |
| 20 | 45.00 | 60 " 75 | 75 " 100 | $\frac{3}{4}$ | 1 | 34 | 540 |
| 221/2 | 55.00 | 75 " 90 | 100 " 130 | 1 | 11/4 | 1 | 720 |
| 25 | 60.00 | 90 " 120 | 130 " 175 | 1 | 11/4 | 1 | 900 |
| 30 | 75.00 | 120 " 165 | 175 " 235 | 11/4 | 11/2 | 11/4 | 1,260 |
| 35 | 90.00 | 165 " 230 | 235 " 300 | 11/2 | 1 1/2 | 114 | 1,740 |
| 40 | 110.00 | 230 " 300 | 300 " 400 | $1\frac{1}{2}$ | 2 | $1\frac{1}{2}$ | 2,230 |
| 45 | 125.00 | 300 " 375 | 400 " 500 | $1\frac{1}{2}$ | 2 | $1^{\frac{1}{2}}$ | 2 820 |
| 50 | 150.00 | 375 " 500 | 500 " 650 | 2 | 21/2 | 2 | 3,480 |
| 55 | 175.00 | 500 " 600 | 650 " 700 | 2 | $2\frac{1}{2}$ | 2 | 3,650 |

TYPE A

| - 1 | | Horse | Power | | | NECTIONS HES | | Capacity Gallons per |
|----------|---------------|--|--|----------------|-----------------|-----------------|--------------------|--|
| Plac | Price Each | For the Ordinary Type of Boller and Engines | On a Basis of 30 Pounds Evaporation per H. P. per Hour | Steam | Suction | Delivery | Overflow | Hour with 100 Pounds Steam Pressure |
| 35 | 60.00 | 80 to 130 | 110 to 180 | 114 | 114 | 114 | 11, | 1020 |
| 30 | 75.00 | 130 " 170 | 180 " 23 5 | $1\frac{1}{2}$ | 11/2 | 11/2 | 112 | 1430 |
| 35 | 90.00 | 170 " 23 0 | 235 " 300 | $1\frac{1}{2}$ | $1\frac{1}{2}$ | 11/3 | 113 | 1975 |
| 30 35 40 | 110.00 | 230 " 300 | 300 " 400 | 2^{r} | 2 | $2^{1/2}$ | 115 | 2530 |
| 45 | 125.00 | 300 " 375 | 400 " 500 | 2 | 2 | 2 | 113 | 3200 |
| 50 | 150.00 | 375 " 500 | 500 " 6 50 | 2 | 216 | 2 | 113 | 3950 |
| 55 | 200.00 | 500 " 600 | 650 " 750 | 2 | $21\frac{5}{2}$ | 2 | $1^{1}\frac{5}{2}$ | 4140 |

PENBERTHY "X L-96" IMPROVED EJECTORS, SYPHON OR STEAM JET PUMPS

Lifts 22 to 25 Feet. Elevates 25 to 100 Feet, 30 to 100 Pounds Pressure



Fig. 4817A

| | | | | ırge, | CA | PACITY, GAI | LONS PER I | lour | Vertic | AL LIFT | |
|----------------|----------|-------------------|--------------------|-------------------|----------|-----------------------------|------------|----------|----------|-----------------------------|--|
| | Each | Body. | Connection, | Discharge | 3-Fo | ot Lift | FEET | | | | |
| | Brass, | Iron B | onne | and | | | NDS | | | | |
| Number | Price, B | Price, Ir Each | Steam C Incl.es | Suction Inches | 40 to 65 | 20 to 40 or 65 to 100 | 40 to 65 | 40 to 65 | 40 to 75 | 25 to 40 or 75 to 100 | |
| 1 | 8.00 | | 3/8 | 1/2 | 240 | 235 | 120 | 180 | 23 | 20 | |
| $\overline{2}$ | 10.00 | | 1/2 | $\frac{37}{4}$ | 500 | 450 | 250 | 375 | 25 | 22 | |
| 3 | 15.00 | | 34 | 1 | 840 | 700 | 420 | 625 | 25 | 22 | |
| 4 | 20.00 | | 1 | 114 | 1350 | 1300 | 650 | 950 | 24 | 211/2 | |
| 5 | 25.00 | 20.00 | 1 | 11/2 | 1950 | 1850 | 975 | 1450 | 26 | 211/2 | |
| 6 | 35.00 | 27.50 | 11/4 | 2 | 3500 | 3000 | 1750 | 2600 | 26 | 211/2 | |
| *7 | 50.00 | 40.00 | 11/2 | 21/2 | 5700 | 4350 | 2500 | 3750 | 26 | 22 | |
| *8 | 70.00 | 50.00 | 2 | 3 | 9500 | 8160 | 4750 | 7200 | 25 | 20 | |
| * 9 | 105.00 | 70.00 | 2 | 31/2 | 13600 | 12400 | 6800 | 10200 | 25 | 21 | |
| *10 | 145.00 | 95.00 | $2\frac{1}{2}$ | 4 | 18400 | 17100 | 9200 | 13800 | 25 | 21 | |

TABLE SHOWING SIZE OF BOILERS REQUIRED FOR JET PUMPS

| Number of Ejector | 1, 2, 3 | 4, 5, 6 | 7, 8 | 9, 10 |
|-------------------------|---------|---------|----------|----------|
| Size Boiler horse-power | 2 to 6 | 8 to 12 | 15 to 20 | 25 to 30 |

^{*}Unless ordered in brass, sizes 7 to 10 inclusive will be shipped with iron body, bronze jets and steam connection.



JET PUMPS, EJECTORS, ETC.

BLAKESLEE JET PUMP



Fig. 4816A

D-8 EJECTOR



Fig. 4816B

BLAKESLEE JET PUMPS

| Size of Pumpinches | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|--------------------|-------|----|--|-------------------------------|---|------------------------|---------------|
| Price | | 1 | | | | $20.00 \ 2\frac{1}{2}$ | |
| Discharge Pipe | 8 8 8 | 15 | $\begin{array}{c c} 1 \\ 20 \end{array}$ | $\frac{1}{3}\frac{1}{4}$ 30 | $\begin{vmatrix} 1\frac{1}{2} \\ \frac{3}{4} \\ 40 \end{vmatrix}$ | 2 1 50 | 2½ 1 60 |

PARTS OF BLAKESLEE JET PUMPS

| Sizeinches | 1/2 | 34 | 11 | 114 | 11/2 | 2 | 21/2 | 3 |
|---------------------------------|-----|-----|-----|-----|------|------|------|------|
| Nutseach | .50 | .50 | .50 | .75 | .75 | 1.00 | 1.50 | 1.50 |
| Malleable Nipples " | .25 | .25 | .25 | .35 | .35 | .60 | .75 | 1.00 |
| Combining Pipes (loose tubes) " | | .75 | .75 | .75 | 1.00 | 1.00 | 1.50 | 1.50 |
| Steam Tubes (tight tubes) " | | .25 | .50 | .50 | .60 | .60 | .75 | .75 |

D-S EJECTORS

| Number | 2 | 3 | 4 | 5 | 6 | *7 | *8 | *9 |
|--|------------|-------------------------------|------|--|------|--------------------------|---|------------------------|
| Priceeach Suction and Discharge Pipeinches Steam Pipe " Capacity per Hourgallons | 1/2 3/8 | 2.00 $\frac{34}{1/2}$ 550 | 1 34 | $\begin{array}{c} 3.50 \\ 11_4 \\ 1 \\ 1900 \end{array}$ | 11/2 | 6.00 2 114 3500 | 7.50 $2\frac{1}{2}$ $1\frac{1}{2}$ 5700 | 9.00 3 2 9500 |

^{*}Iron Body.

STRAINERS-For Injectors and Ejectors

PIPE CONNECTION



Fig. 4816C

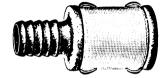


Fig. 4816D

HOSE CONNECTION

| Sizeinches | 1 2 | 34 | 1 | 114 | 11/2 | $\begin{vmatrix} 2 & 2 \end{vmatrix}$ | 12 3 | 4 |
|--|------|------|------|------|------|---------------------------------------|-----------|-------------|
| Price, Union Strainers, All Brass each | 4.00 | 5.00 | 6.00 | 7.50 | 9.00 | 12.00 . | | |
| " Flat " " " " | .30 | .40 | .50 | .60 | .80 | 1.00 1. | 25 1.75 | 2.50 |
| Price, Union Strainers, All Brasseach "Flat " " " " for Hose or Pipe " | .40 | .50 | .60 | .75 | 1.00 | 1.50-2. | 00 2.50 | l . <u></u> |

LUNKENHEIMER BRASS AND STEEL GREASE CUPS

BRASS

"MARINE" Screw Feed



"IDEAL" Automatic Compression



Fig. 5528B

| Number | 00 | 0 | 1 | 2 | 3 | 4 | 5 |
|---|----------------------|----------------------|-----------------------|----------------------|-----------------------------------|----------------------|------------------------|
| Capacityounces Inside Diameter, "Marine"inches " "Ideal"" | 1/8 7/8 7/4 | 1 1!4 1!4 | 1½ 1¾ 1¼ 11/ | 3 2 | 6 25 8 21/2 | $\frac{10}{2^{3}4}$ | 18 31/4 31/4 |
| Size, Thread " Price, "Marine," Finishedench | 1/8 1.00 | 1/4 1.20 | 1.60 | 3/8 2.00 | $\frac{1}{2}$ $\frac{2.80}{2.80}$ | 1/2 4.00 | 7.00 |
| " "Nickel Plated" " "Ideal," Finished" " Nickel Plated" | 1.20 1.50 1.75 | 1.45 2.00 2.25 | 1.90 2.50 2.80 | 2.40 3.20 3.60 | 3.40 4.30 5.00 | 4.75 6.00 6.75 | 8.20 12.50 13.80 |





"TIGER"

| Number | 00 | 0 | 1 | 2 | 3 | 4 |
|---|------|-------------------------------------|---|--|--|--------------------------------------|
| Capacity ounces Inside Diameter inches | 1/2 | $\frac{\frac{2}{3}}{1\frac{7}{32}}$ | 13/ | 17/ | 31/2 | 5 27/6 |
| Height Over All " | 13/4 | 2 | $\frac{13}{8}$ $\frac{25}{16}$ | 17/8 29/6 | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | 314 |
| Size Thread " Price, Rough each | .56 | 74 | $\begin{array}{c c} & \frac{1}{4} \\ & .96 \end{array}$ | $\begin{array}{c} & \frac{3}{8} \\ & 1.28 \end{array}$ | $\frac{1}{2}$ | \ \frac{1}{2} \\ \dot 2 \\ 30 align* |
| " Finished " | .70 | .90 | 1.15 | 1.50 | 2.15 | 2.90 |
| " Nickel Plated " | .82 | 1.06 | 1.36 | 1.80 | 2.60 | □3.40 |



Pig. 5528D

PLAIN STEEL

| Number | 00 | 0 | 1 | 2 | 3 | 4 |
|---------------------------------------|-------------|-----------------------------------|--------|---------------|--------------------------|--------|
| Capacityounces Inside Diameter inches | 1/2 | ² / ₃ 1½ | 1 11/6 | $\frac{2}{2}$ | 31. ₂ 21.5 | 5 3 |
| Size Thread " Height Over All " | 1 /8 13/ | 1/4 21/3 | 2.1 | 3/8 25% | 214 | 31/2 |
| Price each | .25 | .35 | .45 | .55 | .80 | 1.05 |

BRASS OIL CUPS

PLAIN LOCOMOTIVE Fig. 6839B





HINGED LID

| Diameter inches | 5/8 | 3/4 | 7/8 | 1 | 11/4 | 11/2 | 13/4 | 17/8 | 2 | 21/4 | $2\frac{1}{2}$ |
|--|-----|-----|---------------------------|------|------|------|------|------|------|------|----------------|
| Size Threadinches Price, Plaineach "Locomotive" "Hinged Lid" | .70 | .85 | 1/8 .35 1.05 .70 | 1.25 | 1.50 | 1.90 | 2.40 | 2.80 | 3.30 | 4.30 | 5.00 |

ELBOW SHANK





TEE HANDLE





LEVER HANDLE

Fig. 6839E Fig. 6839F

Fig. 6839G

| Diameter inches | 5/8 | 34 | 7⁄8 | 1 | 1!4 | 11/2 | 134 | 17/8 | 2 | 214 | $2\frac{1}{2}$ |
|--|-------------------|-----|-----|------|------|------|------|------|------|----------------------|----------------|
| Size Threadinches Price, Elbow Shankeach "Tee Handle" "Lever Handle" | .55 .75 .85 | .80 | .90 | 1.00 | 1.50 | 2.00 | 2.50 | 2.75 | 3.00 | 3.00 3.75 4.00 | 4.50 |

SELF-CLOSING OIL CUPS, NICKEL PLATED STYLE A

Open

Closed



STYLE B Closed











Fig. 6839K



Fig. 6839H

Fig. 6839J

| 4 | 5 | 6 | 7 | 8 |
|-----|-----|-----|-------------|------|
| 7/6 | 1/2 | 1/2 | 1/4 Dina | Pipe |

| Number | , 1 | _ | 0 | 1 | 9 | U | ' | , ° |
|--|-----------------|----------------------------|-----------------------------|-----------------------------|--|-------------------|----------|---------------|
| Size Threadinches Number of Threadsper inch Price, Style "A"per hundred "Style "B" " | $3\overline{2}$ | 5/16 32 9.50 9.50 | 3/8 24 10.70 10.70 | 7/6 24 12.50 12.50 | $ \begin{array}{r} $ | 24 22 22.00 | | Pipe 38.00 |

Nos. 7 and 8 are fitted with inner Tube and Wick.

LUNKENHEIMER LOCOMOTIVE OIL CUPS



Fig. 480



| 3A | F | j |
|----|---|---|
| | | |

| WAIN AND CIDE | | OHIDI | D AND DI | O TO N | |
|----------------------------|-------|----------------|----------|-------------------------|-------|
| Price, Finished Brass each | 1.80 | 2.00 | 2.50 | 3.00 | 4.00 |
| Diameter of Blank Shank " | 15/16 | 15/16 | 15/16 | 15/16 | 15/16 |
| Height " | 43/16 | 45/8 | 41/16 | 47/16 | 5 |
| Inside " " | 11/2 | 13/4 | 11/2 | 13/4 | 2 |
| Outside Diameterinches | 25/16 | 25/8 | 21/8 | 21/2 | 3 |
| Capacityounces | 11/2 | $2\frac{1}{2}$ | 11/2 | $\frac{21_{2}}{21_{2}}$ | 4 |
| Number | 11/2 | 2 | 11/2 | 2 | -3 |
| Description | | in Oilers | (| rs | |

MAIN AND SIDE ROD OILER









Fig. 4803D

| Description | | ain and Si Rod Oiler | Guide and Pistor Rod Ollers | | |
|--|---|---|----------------------------------|--|-----------------|
| Number | 1 3 23/6 | 2 41/2 27/6 | 3 7½ 211/6 | $\begin{array}{c} 1 \\ 2\frac{1}{4} \\ 2\frac{1}{8} \end{array}$ | 3.4 211 |
| Inside " " Height Regulating Screw Closed " Cross Corners of Hexagon at Base " | $\begin{array}{c} 2 \\ 5\frac{1}{2} \\ 25 \\ \end{array}$ | $ \begin{array}{c c} 21/4 \\ 53/4 \\ 27/8 \end{array} $ | 27 ₁₆ 65/8 33/6 | 133 41/8 25/6 | 1% 4% 243 |
| Diameter of Blank Shank " Price, Finished Brass each | 15)6 4.00 | 4.70 | 6.00 | 2.80 | 4.00 |

Unless otherwise specified, the shanks of all oil cups shown on this page will be left blank.

An extra charge will be made for Threading Shanks in lots of less than twenty-

five of the same size cup.

Main and Side Rod Oilers have Steel Shanks. The body is of Bronze composition.

LUNKENHEIMER GLASS BODY OIL CUPS

"MIAMI." SCREW TOP

"PIONEER." SLIDE TOP

"ROYAL." SIGHT FEED







Fig. 855A

Fig. 855B

Fig. 855C

| Number | 000 | 00 | O | 1 | 1 1/2 | 2 | 3 | 4 | 5 | 6 | 8 |
|--------------------------------|----------|------------|------|------|----------------|----------------|----------|------|------|----------------|-------|
| ('apacityounces | ا ئەل | 1/2 | 5/8 | 1 | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4 | 5 | 10 | 18 | 34 |
| Diameter of Glass inches | 1 | 11/8 | 11/4 | 11/2 | 1^{3}_{4} | 2 | 214 | 21/2 | 3 | $3\frac{1}{2}$ | 414 |
| Height of Glass " | 7/8 | 1 | 11/8 | 13/8 | 158 | 17/8 | 21_{8} | 23/8 | 3 | 4 | 5 |
| Size Thread " | 18 | 1/8 .75 | 1/8 | 14 | 14 | 3/8 | 3.8 | 3/8 | 1/2 | 1/2 | 34 |
| Price, "Miami," Finished, each | .70 | .75 | .80 | 1.00 | 1.25 | | | | 3.10 | | |
| " "Pioneer," " " | .70 | .75 | .80 | 1.00 | 1.25 | 1.50 | -1.90 | 2.40 | 3.10 | 4.00 | 8.50 |
| " "Royal" " " | .95 | 1.10 | 1.25 | 1.50 | 1.75 | | 2.55 | 3.15 | 3.90 | 4.80 | 10.00 |
| Add for Nickel Plating " | .10 | .10 | .15 | .20 | .25 | 25 | .30 | .35 | 40 | .50 | 1.00 |

"CROWN." INDEX SIGHT FEED

"VICTOR," INDEX TOP





Fig. 855D

Fig. 855E

| Number | 000 | 00 | 0 | 1 | $1\frac{1}{2}$ | 2 | 3 | 4 | 5 | 6 | 8 |
|---|-----|-----|------|------|----------------|------|----------|----------------|------|-------|-------|
| Capacity ounces Diameter of Glass inches | 14 | 1/2 | 5.8 | 1 | 112 | 212 | 4 | 5 | 10 | 18 | 34 |
| Diameter of Glassinches | 1 | 118 | 114 | 11/2 | 137 | 2 | $2^{1}i$ | 213 | 3 | 315 | 41, |
| Height of Glass " | 7/8 | 1 | 11/8 | 138 | 158 | 178 | 21% | $2\frac{3}{8}$ | 3 | 4 | 5 |
| Size Thread " | 1/2 | 1/8 | 1/6 | 14 | 1.1 | 3/8 | 3,8 | 3/8 | 1.6 | 1/2 | 34 |
| Price, "Crown," Finished, each | | | 1.25 | 1.50 | 1.75 | 2.10 | 2.55 | 3.15 | 3.90 | -4.80 | 10.00 |
| | | | 1.00 | 1.20 | 1.45 | 1.75 | 2.15 | 2.70 | 3.40 | 4.30 | 9.25 |
| | | | | | | .25 | | | | | |

LUNKENHEIMER GLASS OIL CUPS SCREW FEED NEEDLE VALVE FRED



AUTOMATIC ROD CUPS

FOR ENGINE CRANK PINS

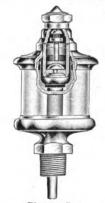


Fig. 861A

Fig. 861B

| | 0. 0010 | | | | | | | | | |
|---------------------------------------|---------|------|------|------|------|------|--|--|--|--|
| Number | 0 | 1 | 11/2 | 2 | 3 | 4 | | | | |
| Capacityounces | 5/2 | 1 | 11/2 | 21/2 | 4 | 5 | | | | |
| Diameter of Glassinches | 114 | 11/2 | 134. | 2 | 21/4 | 21/2 | | | | |
| Height of Glass " | 11/8 | 13/8 | 15/8 | 17/8 | 21/8 | 23/8 | | | | |
| Size Thread | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | 3/8 | | | | |
| Price, Finished each "Nickel Plated " | 1.10 | 1.50 | 2.00 | 2.50 | | 4.00 | | | | |
| Nickel Flated | 1.25 | 1.70 | 2.25 | 2.75 | 3.30 | 4.35 | | | | |

Needle Valve Feed Cups are not made in size No. 0.

EXTERIOR Showing Plug Raised for Filling

SECTIONAL
Showing Interior Construction



CHAMPION ROD OIL CUPS

SUITABLE FOR ALL MOVABLE BEARINGS

Starts to feed as soon as machinery is put in motion. Stops feeding when movement of machinery ceases,



Fig. 861C

Fig. 861D

| Number | 1 | 2 | 3 | 3^{1}_{2} | 4 |
|---|-------------------|------|------|-------------|---|
| Capacity ounces Outside Diameter inches | 137 | 21/2 | 5 | 8 | 12 |
| Width " | 15/8 | 156 | 21/4 | 296 | $\begin{vmatrix} 4 \\ 2\frac{7}{8} \end{vmatrix}$ |
| Size Thread | $\frac{14}{1.40}$ | 2.00 | 2 60 | 3 50 | 4 00 |
| " Nickel Plated | 1.50 | 2.20 | 2.80 | 3.85 | 4.40 |

LUNKENHEIMER SNAP LEVER, SIGHT FEED GLASS OIL CUPS, ETC.

"SENTINEL"

STRAIGHT SHANK LEVER UP. CUP FEEDING



ELBOW SHANK LEVER DOWN, FEED STOPPED











Fig. 859C

| Number | 0 | 1 | 1½ | 2 | 3 | 4 | 5 | 6 | 8 |
|---|------|------|------|---------------------------|-------------|------|------|-------|-------|
| Capacityounces | 5/8 | 1 | 11/2 | $\overline{2\frac{1}{2}}$ | | 5 | 10 | 18 | 34 |
| Diameter of Glassinches | 114 | 11/6 | 134 | 2 | 2^{1}_{4} | 21/2 | 3 | 31/2 | 41/4 |
| Height of Glass " Size, Thread " Price, Finished Brass each | 11/8 | 13/8 | 15% | 17/8 | 21/8 | 23/8 | 3 | 4 | 5 |
| Size, Thread | 1/8 | 1/4 | 1/4 | 3/8 | 3/8 | 3/8 | 1/2 | 1/2 | 3/4 |
| Price, Finished Brasseach | 3.00 | 3.25 | 3.50 | 3.75 | 4.25 | 5.25 | 7.25 | 9.25 | 20.00 |
| " Nickel Plated " | 3.50 | 3.75 | 4.00 | 4.25 | 4.75 | 5.75 | 8.00 | 10.25 | 22.00 |
| " Elbow Shank, Finished Brass " | 3.50 | 3.80 | 4.10 | 4.50 | 5.00 | 6.00 | 8.25 | 9.25 | 21.50 |
| " Nickel Plated. " | 4.00 | 4.30 | 4.60 | 5.00 | 5.50 | 6.50 | 9.00 | 10.25 | 23.50 |

The "Sentinel" Snap Lever Sight-Feed Glass Oil Cup is handsome and ornamental in appearance and thoroughly strong and substantial in construction. It will hold up its rate of feed until the cup is entirely emptied. Great care is taken in the manufacture of these cups, and we warrant them to be first class in every particular, and

unequaled in durability, efficiency and reliability.

We are prepared to furnish the "Sentinel" cups with ell shank as shown in cut, which are intended for side or end connection. Ell shank cups will not be furnished, however,

unless specified.

OIL CUP GLASSES AND CORKS



| Fig. | 859D |
|------|------|

| Number | 000 | 00 | 0 | 1 | $1\frac{1}{2}$ | 2 | 3 | 4 | 5 | 6 | 8 |
|------------------------|------|------|----------------|---------------------------|----------------|----------------|-------------------|----------------|-----------|-------------------|------|
| Outside Diameterinches | 1 | 11/8 | $\overline{1}$ | $\overline{1\frac{1}{2}}$ | 134 | 2 | $2^{\frac{1}{4}}$ | $2\frac{1}{2}$ | | $\overline{31_2}$ | 41/4 |
| пери | 1/8 | 11/ | $\frac{11}{8}$ | $\frac{13}{8}$ | 15/8 | $\frac{17}{8}$ | $\frac{21}{8}$ | $\frac{23}{8}$ | 3 35∠ | 41/ | 5 |
| Priceeach | .05 | .06 | .08 | .10 | .10 | .12 | .15 | .25 | 1.35 | $.65^{2}$ | 1.50 |
| " Corksper dozen | . 15 | .18 | .24 | .30 | .36 | .40 | . 45 | .50 | .60 | .75 | 1.50 |

These glasses are clear, strong and uniform in size and are interchangeable with all styles of glass cups made.

When ordering, always specify which glass is wanted. All sizes cylindrical glasses and corks furnished to order.

GLASS BODY SIGHT FEED LUBRICATORS

FOR GAS, GASOLINE OR OIL ENGINES

"PARAGON"



COUNTENNE IMER

Fig. 883B



"EXPLOSO"

Fig. 883C

"PARAGON"

| Capacityounces | 11/2 | 21/2 | 4 | 5 | 10 | 18 | 32 |
|-----------------------------------|-------|---------------|----------------|----------------|------|------|-------|
| Height of Glassinches | -15/8 | 11/8 | 21/8 | 23 8 | 3 | 4 | 5 |
| Diam. " " " | 13/4 | $\frac{2}{3}$ | $\frac{21}{4}$ | $\frac{21}{2}$ | 3 | 31/2 | 41/4 |
| Size Thread " Price, Finishedeach | 2.00 | 2.80 | 3.50 | 4.00 | 5.40 | 7.00 | 14.00 |
| " Nickel Plated" | 2.40 | 3.25 | 4.10 | 4.60 | 6.25 | 8.20 | 16.40 |

"MARS"

| Capacityounces | $\overline{2!_2}$ | 4 | 5 | 10 | 18 |
|--|------------------------|-----------------|----------------|-------|---------|
| Height of Glassinches Diam. " "" | $\frac{1_{68}^{7}}{6}$ | $\frac{21}{21}$ | $\frac{23}{8}$ | 3 | 4 3½ |
| Size Thread " | 3/8 | 3/8 | 1/2 | 1/2 | 3/4 |
| Price, Brasseach | 5.00 | 6.00 | 8.00 | 10.00 | 12.00 |
| " Finished and Nickel Plated. " " Extra Sight Feed | 6.00 | 7.25 | 9.50 | 12.00 | 14.00 |
| Glasses per doz. | .60 | .60 | .60 | .60 | .60 |

"EXPLOSO"

| Capacityounces | 1 | $1\frac{1}{2}$ | 21/2 | 4 | 5 | 10 | 18 |
|---|----------------|------------------|-------------|------|----------------|---------------|-------|
| Height of Glassinches | 138 | $\frac{-15/8}{}$ | 17/8 | 21/8 | 23 8 | 3 | 4 |
| Diam. " " " | $1\frac{1}{2}$ | $1\frac{3}{4}$ | 2° | 21/4 | $2\frac{1}{2}$ | 3 | 31/2 |
| Size Thread " | 14 | 14 | 3/8 | 38 | 3 8 | $\frac{1}{2}$ | 1,2 |
| Price, Finished each | 4.50 | 4.75 | 5.00 | 5.50 | 6.50 | 9.00 | 11.50 |
| " Nickel Plated " | 5.00 | 5.25 | 5.50 | 6.00 | 7.00 | 9.75 | 12.25 |
| " Extra Glasses " | . 10 | .10 | .12 | .15 | .25 | .35 | .65 |
| Cork Washers per doz. | .30 | .36 | .40 | . 45 | .50 | . 60 | . 75 |

LUNKENHEIMER OILING DEVICES

ANGLE DRIP

STRAIGHT DRIP F1g. 866A STRAIGHT SIGHT-FEED VALVE







CORNER DRIP

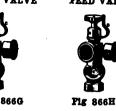


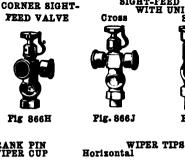
CROSS SIGHT-PEED VALVE

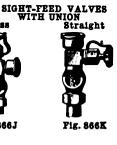
Pig. 866F



ANGLE SIGHT-







ADJUSTABLE Plain

Pig. 866L



WICK WIPER CUPS





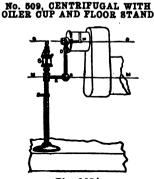


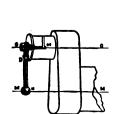
Oil Cup

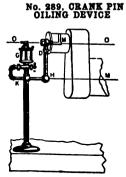
FINISHED BRASS NICKEL PLATED Style of Finish Size.....inches 1/8, 1/4 or 3/8 1/8, 1/4 or 3/8 1/6 1/2 Price, Cross Drip Valve...each
"Straight Drip Valve."
"Angle Drip Valve." 1.50 1.60 1.75 1.85 1.25 1.50 1.65 1.40 1.25 1.40 1.50 1.65 1.75 1.50 1.60 1.85 2.30 3.20 2.60 3.50 2.00 Straight Sight-Feed Valve..... 3.00 2.25 3.25 2.00 Angle Sight-Feed Valve..... 3.00 2.25 3.25 2.30 3.20 2.60 3.50 66 2.80 3.70 3.10 4.00 2.50 2.80 Straight Sight-Feed Valve with Union 3.50 3.80 Angle Sight-Feed Valve with Union 2.50 2.803.50 3.80 2.80 Corner Sight-Feed Valve with Union 3.70 3.10 4.00 Plain Wiper Cup, Straight Shank ... 2.50 3.00 3.00 3.50 .. Elbow 3.00 3.50 3.50 4.00 66 44 Wick Straight 2.50 3.00 3.00 3.50 44 22 Elbow 66 3.00 3.50 3.50 4.00 Crank Pin Wiper Cup...... Horizontal Wick Taper Cup..... 2.50 3.00 3.00 3.50 2.30 2.00 2.30 2.60 Wiper Tips..... .40 .50 .50 .60

LUNKENHEIMER OILING DEVICES

ADJUSTABLE CENTRIFUGAL AND CRANK PIN No. 508, PLAIN OILER ARM







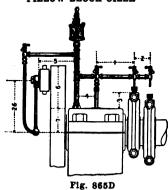
Pig. 865A

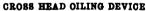
Fig. 865B

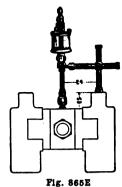
Fig. 865C

| Num | ber. | | | | | | | | | 1 | 2. | 3 |
|-------|-------|--------|--------|---------|-----------|---|------|----|------|----------|----------|----------|
| Leng | th o | f Str | oke | | • • • • • | | | in | ches | Up to 16 | Up to 30 | Up to 60 |
| Size | of T | hreac | d on B | olt (O) | | | | | " | 3/8 | 3/8 | 1,6 |
| Price | , No. | . 509, | Brass | Finish | | | | (| each | 15.00 | 17.00 | 21.00 |
| " | " | 508, | | " | | | | | " | 6.00 | 7.00 | 9.00 |
| 46 | " | 289, | 44 | ** | | | | | 66 | 22.50 | 27.00 | 33.00 |
| 66 | 44 | 509, | 44 | Nickel | Plate | d | | | " | 18.00 | 20.50 | 25.00 |
| 46 | " | 508, | 44 | 46 | 46 | | | | 46 | 7.00 | 8.00 | 11.00 |
| 44 | " | 289, | 44 | 44 | 66 | | | | 44 | 24.00 | 29.50 | 35.50 |

PILLOW BLOCK OILER



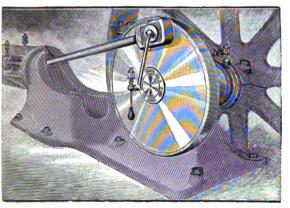


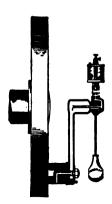


In ordering any of the above, give size of oil cup wanted, style of sight feed valve desired, all dimensions as per diagram lines, stroke of engine and style of trimmings. Prices on application.

When desired, the complete device can be used for feeding grease instead of oil. In such cases we furnish, without extra charge, a grease cup in place of the oil cup. When not otherwise specified, we will send an oil cup of a size proportionate to that of the oiler arm.

NUGENTS OILING DEVICES

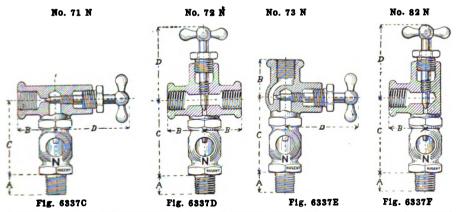




Pig. 6337A Fig. 6337B

| Strokeinches | 6 to 16 | 17 to 30 | 31 to 48 | 49 to 72 |
|---|---------|-------------------|--------------------|------------------|
| Capacity Oil Cupounces Shank of "inches Price, Polishedeach | 3/8 | 5 3 8 12.00 | 10 1/2 15.00 | 16 ½ 18.00 |

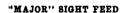
Prices do not include oil cups. If not specified we send standard sizes of bolts with each device.



| Size. | | | inches | 14 | 3 8 | 1/2 | 34 |
|--------|-----|------|--------------|------|------|------|------|
| Price. | No. | 71 N | Finishedeach | 2.00 | 2.00 | 2.30 | |
| 11 | | | Nickel | 2.25 | 2.25 | 2.55 | |
| 4 | 44 | 72 N | Finished | 2.25 | 2.25 | 2.70 | 3.50 |
| | .66 | 72 N | Nickel | 2.50 | 2.50 | 2.95 | 3.80 |
| ** | 16 | 73 N | Finished | 2.00 | 2.00 | 2.30 | |
| 14 | 16 | 73 N | Nickel | 2.25 | 2.25 | 2.55 | |
| 44 | .66 | 82 N | Finished | 2.00 | 2.00 | 2.30 | 3.25 |
| 64 | 44 | 82 N | Nickel | 2.25 | 2.25 | 2.55 | 3.55 |

State tap for inlet, size of thread for outlet, and finish desired.

LUNKENHEIMER BRASS LUBRICATORS





GRAPHITE AUTOMATIC SIGHT FEED





Fig. 5547B

Pig. 5547C

"MAJOR"

| Number | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------------------|------|------|------|------|------|-------|-------|
| Diameterinches | 1116 | 17/8 | 2 | 214 | 21/2 | 3 | 33/8 |
| Size Thread " | 3/8 | 3/8 | 1/2 | 1/2 | 1/2 | ⅓. | 3/4 |
| Capacityounces | 1 | 1½ | 21/2 | 4 | 5 | 10 | 18 |
| Price, Finishedeach | 3.50 | 4.00 | 5.00 | 6.00 | | | 12.00 |
| " Nickel Plated " | | | | | | 12.00 | |
| " Extra Bulls-Eyesper dozen | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |

"GRAPHITE"

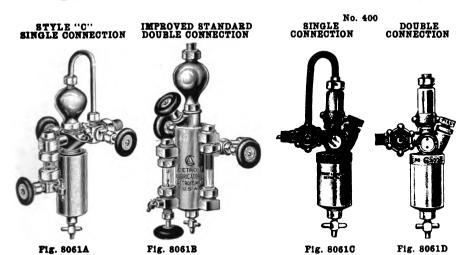
| Number | 1 | 2 | 3 |
|---|-------|----------------------------|----------------|
| Size Thread inches Capacity (Graphite) ounces Price, Finished each "Nickel Plated " | 10.00 | 1/2 5 12.00 14.00 | 16.00 18.00 |

The "Graphite" Sight Feed Lubricator is designed for feeding POWDERED GRAPHITE. The graphite is fed automatically and continuously in desired quantities, and visibly, by passing it through a sight feed. The lubricator requires but one connection to the cylinder. It is not advisable to use graphite alone; it is good practice, therefore, to use in connection with the "Graphite" Lubricator either an oil pump or sight feed lubricator.

PLAIN

| Diameterinches | 1 | 114 | 11, | 13/1 | 2 | 21/4 | 21,6 | 3 | 31/2 | 4 |
|--------------------|------|------|-----------|----------------|----------------|------|------|------|------|-------|
| Size, Threadinches | 3 4 | 3 s | -3 s | 1/2 | 1/2 | 1/2 | 1/2 | 3/4 | 3,4 | 3/4 |
| Capacityounces | 3/4 | 1 | $ 11_{4}$ | $1\frac{1}{2}$ | $2\frac{1}{2}$ | 4 | 5 | 10 | 18 | 24 |
| Priceeach | 2.00 | 2.20 | 2.40 | 2.60 | 2.90 | 3.25 | 3.75 | 4.75 | 7.00 | 10.00 |
| " with Cock | | | | | | | | | | |
| and Tube " | 3.00 | 3.20 | 3.40 | 3.60 | 3.90 | 4.25 | 4.75 | 5.75 | 8.00 | 11.00 |

"DETROIT" SIGHT FEED LUBRICATORS



STYLE "C"-SINGLE CONNECTION

| Capacity | 1/4 Pint | 1/3 Pint | 1/2 Pint | 1 Pint | 1 Quart |
|---|----------|--------------|----------|--------|--------------------------|
| Size Thread inches Price. Finished each | | 1/2 17.00 | 20.00 | 28.00 | 1/ ₂ 42.00 |
| " Nickel Plated " | 18.00 | 20.00 | 23.00 | 32.00 | 47.00 · |

Size of Glass, Sight Feed, for $\frac{1}{4}$, $\frac{1}{8}$ and $\frac{1}{2}$ pint, $\frac{3}{4}$ x $2\frac{1}{8}$ inches, pint and quart sizes same as Improved Standard Double Connection Lubricators.

IMPROVED STANDARD-DOUBLE CONNECTION

| Capacity | 1/3 Pint | ½ Pint | 1 Pint | 1 Quart | ½ Gallon | 1 Gallon |
|------------------------|------------|------------|------------|------------|------------|------------|
| Size Threadinches | 1/2 | 1/2 | 12 to 18 | 1/2 | 3/4 | 3/4 |
| For Cylinders " | Under 10 | 10 to 12 | 12 to 18 | 18 to 30 | 30 & over | |
| Price, Finished , each | 17.00 | 22.00 | 30.00 | 45.00 | 60.00 | 75.00 |
| Nickel Plated " | 20.00 | 25.00 | 35.00 | 50.00 | 65.00 | 80.00 |
| Sight Feed Glassinches | | 3/4 x 3 | 3/4 x 3 | 3/4 x 31/4 | 3/4 x 31/4 | 3/4 x 31/4 |
| Gauge Glass " | 5/8 x 21/6 | 5/8 x 31/4 | 5/8 x 43/8 | 5/8 x 43/8 | 34 x 6 | 3/4 x 73/4 |

No. 400-SINGLE CONNECTION

| Cepacitypints | 14 Pint | 1/3 Pint | 1/2 Pint | 1 Pint | 1 Quart |
|---------------------------|---------|----------|----------|--------|---------|
| Size Threadinches | | 3 3 | 3 8 | 1/2 | 1/2 |
| Price, Polished Brasseach | 3.50 | 3.75 | 4.00 | 6.00 | 7.50 |
| " Nickel Plated " | 3.90 | 4.15 | 4.40 | 6.65 | 8.15 |

No. 400-DOUBLE CONNECTION

| Capacity | 1/4 Pint | 1/3 Pint | 1/2 Pint | 1 Pint | 1 Quart |
|--|----------|----------|----------|-------------|---------|
| Size Threadinches Price, Polished Brasseach | 2.75 | 3,00 | 3,25 | 1/2 4.65 | 6.15 |
| " Nickel Plated" | 3.15 | 3.40 | 3.65 | 5.30 | 6.80 |

In the "400" bulls-eye the "drop of water" passing down between two bulls-eye glasses with light on either side, is always visible. Every drop of water displaces a drop of oil, insuring a steady and easily regulated feed to the cylinders.

P IVI VOI VAIALUGUE, ORDEN BY FIGURE .

BRASS SIGHT FEED LUBRICATORS

Por Gas, Gasoline or Oil Engines Air Compressors, Etc.

"BANNER"

LUNKENHEIMER
"VULCAN." FORCE FEED

"DETROIT"





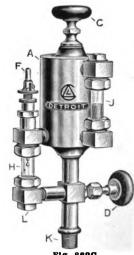


Fig. 882C

LUNKENHEIMER "BANNER"

| Diameter inches | $-\frac{11}{2}$ | 13/4 | 2 | 21/4 | 212 | 3 | 31/2 |
|------------------------------|-----------------|------|------|------|------|-------|-------|
| Capacityounces | 11/6 | 21/2 | 31., | 41/2 | 6 | 10 | 18 |
| Size Threadinches | | 3 🐔 | 1/5 | 1/5 | 1/2 | 1,5 | 3 4 |
| Price, Brass each | 3.50 | 4.00 | 5.00 | 6.00 | 8.00 | 10.00 | 12.00 |
| " Nickel Plated " | 4.20 | 5.00 | 6.00 | 7.25 | 9.50 | 12.00 | 14.00 |
| " Extra Sight-Feed Glasses " | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |

LUNKENHEIMER "VULCAN." FORCE FEED

| Diameter inches | 2 | 25/8 | 314 | 35/8 | 41/4 |
|--------------------------------------|------------------|------|------|-------------|-------------|
| Size Thread inches | 1/4 | 3/8 | 1/2 | 1/2 | 3/2 |
| Capacity ounces Price, Finished each | $\frac{1}{5}.00$ | 6.00 | 8.00 | 6½ 10.00 | 15 15.00 |
| " Nickel Plated " | 6.00 | 7.25 | 9.50 | 12.00 | 17.50 |

The "Vulcan" Force Feed Lubricator is intended for feeding HEAVY OILS WHEN COLD to gas engines and air compressor cylinders. The spring-actuated piston causes a force feed. It is also recommended for use on bearings requiring heavy oil. Does not feed grease.

"DETROIT"

| Capacitypints | 14 | 1/3 | 1/2 | 1 | 2 |
|---|----------------|---------------|---------------|----------------|----------------|
| Size Threadinches Price, Finishedeach "Nickel Plated" | 15.00 18.00 | 17.00 20.00 | 20.00 23.00 | 28.00 32.00 | 42.00 47.00 |

Size of sight feed glass, 5 x21/6 inches.

1/4 and 1/3 pint sizes equipped with sight feed glass only. Ammonia Cylinder Lubricators, composed of special material same as "Detroit." Illustration, list, etc.

 P_{ij}

LOCOMOTIVE LUBRICATORS

THE DETROIT No. 31 TRIPLE PRED LOCOMOTIVE LUBRICATOR



Fig. 881A

THE DETROIT LOCOMOTIVE LUBRICATORS

The Detroit No. 21 Locomotive Lubricator is triple sight feed style and is of three pints capacity. It delivers the oil to both steam cylinders and also to the air pump. It is equipped with bull's-eye glass disks more than one inch thick so that all danger from broken glasses is entirely overcome.

The Detroit No. 11 Locomotive Lubricator is double feed pattern and is of two pints capacity. It delivers the oil to the two steam cylinders only. In other respects it is similar to the No. 21 style.

TRIPLE FEED LOCOMOTIVE LUBRICATOR With Auxiliary Oilers and Gauge Glass

Wherein these devices differ from Lubricators of the former type: By adopting a Sight Feed Glass that will not break under any condition of service. All danger of injury to enginemen, and delays resulting from the bursting of Lubricator Glasses has been removed.

It is the only safe Locomotive Lubricator. It occupies 25 per cent less space in the cab.

It has 40 per cent less parts. It has 35 per cent less varieties of parts.

It has 85 per cent less metal joints.

No arms to shake loose, causing leakage.

No valves on the inside nor outside not necessary in the operation of a perfect Lubricator.

A Glass and its packing so designed and located that the conditions are ideal. preventing sudden and extreme changes in temperature, and allowing perfect freedom for expansion or contraction.

A Packing that will neither vulcanize nor blow out. The metal formerly used in arms, by-pass valves, etc., is now in the metal line of the Lubricator, its valve stems and their

stuffing boxes, giving additional strength and durability.

This device is simple in construction and simple of operation. The oil is maintained at a uniform temperature, and will not chill.

The feed is absolutely regular.

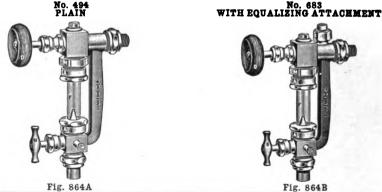
All feeds are visible from two sides.

It saves oil.

As compared with the former type, the cost of repairs is practically eliminated.

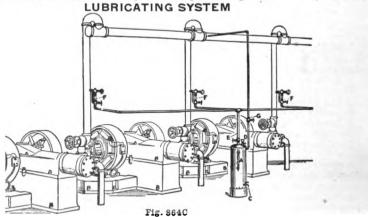
An additional valve has been placed at the top of the Lubricator to control the supply of steam from the boiler, making the device self-contained.

LUNKENHEIMER INDEPENDENT SIGHT FEEDS



| Number | 494 | 683 |
|---|------|------|
| Size of Shank inches " " Oil Connections " Price, Plain Finish each | 3/8 | 3/8 |
| Price, Plain Finisheach | 6.00 | 6.50 |
| " Nickel Plated | 7.00 | 7.50 |

"Independent" Sight Feeds are intended for use in connection with closed pressure tank systems for the purpose of supplying oil to steam chests and cylinders of steam engines. This method of lubrication is often used where a number of engines are in close proximity to each other and the oil for all is supplied from a centrally located tank under pressure. The Plain Sight Feed is intended for use on simple engines and should be connected above the throttle valve. The Sight Feed with Equalizing Attachment can be attached on the steam chests of simple or compound engines.



The illustration shows a conventional method of attaching the "Independent" sight feeds. This system of lubrication comprises a centrally located tank of large size to hold the cylinder oil, from which can be led off any number of pipes to the engine. This system of lubrication is very economical, for the reason that no oil is wasted as is the case in filling a number of small independent lubricators, and, if properly arranged and sufficient hydrostatic pressure is placed on the tank, the oil can be fed with great regularity.

While the illustration shows simply a conventional form of attachment, this system can be adapted in a number of ways, so that the tank can be located at any part of the engine room most convenient.

HAND CYLINDER OIL PUMPS





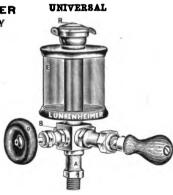


Fig. 4845A

Fig. 4845B ALPHA OR UNIVERSAL GLASS BODY

| Number, Alpha "Universal" | 3 3A | 5 5A | 6 6A | 8 8A |
|------------------------------|----------|---------|---------|---------|
| Capacity | 1/8 Pint | ½ Pint | 1 Pint | 1 Quart |
| Diameter of Glass inches | 21/4 | 3 | 31/2 | 41/4 |
| Height of Glass | 21/8 | 3 | 4 | 5 |
| Size Thread " | 3/8 | 3/8 | 1/2 | 1/2 |
| Price, Finishedeach | 7.50 | 8.50 | 10.00 | 15.00 |
| " Nickel Plated" | 8.25 | 9.50 | 11.00 | 16.50 |
| " Extra Glasses" | .15 | .35 | .65 | 1.50 |
| " Washers per dozen | .45 | .60 | .75 | 1.50 |

UNIVERSAL, BRASS BODY-Dimensions Same as Glass Body 5A 6A 8A 3A Price, Finished each 8.30 9.50 11.00 16.50 Nickel Plated " 9.10 10.30 12.20 18.20

Universal Oil Pumps are equipped with reversible Shank, and can be attached either vertically or horizontally.

ANGLE Nos. 03, 6, 7 SHERWOOD BRASS BODY

HORIZONTAL Nos. 3. 04. 4. 5



or Strainer Top %-inch Shank Thread



Fig. 4845C

Fig 4845D

| Description | Angle Horizontal | | | | | zontal | | | |
|-------------|------------------------|---|---------------------------------|-----------------------|---|---|---|--|--|
| Number | 03 $2x2$ 3.50 4.00 | $ \begin{array}{r} 6 \\ \frac{1}{2} \\ 2\frac{3}{4} \times 2\frac{3}{4} \\ 5.00 \\ 5.50 \end{array} $ | 7 1 3½x3½ 7.50 8.00 | 3 $2x2$ 3.50 4.00 | $\begin{array}{r} 04 \\ \frac{1}{2} \\ 2\frac{3}{4}x2\frac{3}{4} \\ 5.00 \\ 5.50 \end{array}$ | $\begin{vmatrix} 4 \\ 1 \\ 3\frac{1}{2}x3\frac{1}{2} \\ 7.50 \\ 8.00 \end{vmatrix}$ | $ \begin{array}{c} 5 \\ 3 \\ 7x4\frac{1}{2} \\ 12.00 \\ 12.75 \end{array} $ | | |

MANZEL FORCE AND SIGHT FEED PUMPS

CLASS "B"



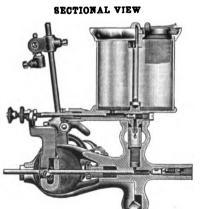
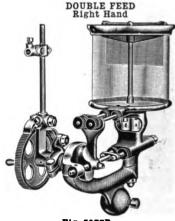


Fig. 5977C



Pig. 5977B

It requires but a glance at the accompanying section cut to see the simplicity of the Manzel Force and Sight Feed Oil Pump, Class "B", to understand why it has withstood the test of many years, and proven successful when others have failed.

There is nothing complicated in its construction. The oil is simply forced out of the reservoir and through the sight glass by the upper plunger, and it is then forced on through the check valves, and into the steam cylinder by the lower plunger—the amount of oil supplied with each stroke being adjusted on the upper plunger.

The feed is always in sight and is very easily and accurately adjusted. No liquid is used in the sight feed, and there is no pressure on the sight glass nor on the reservoir.

On pumps with more than one feed each feed is regulated independently.

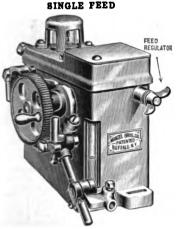
Every pump is equipped with a hand attachment for use before starting the engine or if more oil is needed momentarily.

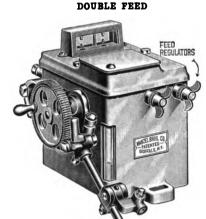
All Manzel Pumps are guaranteed to give positive lubrication and to feed regularly under all conditions, and to reduce oil consumption from thirty to sixty per cent. Finish-Nickel plated.

| Capacityp | | | | | 3 | 5 | 8 |
|--------------------|------|-------|-------|-------|-------|-------|--------|
| Price, Single Feed | each | 16.00 | 20.00 | 25.00 | 30.00 | 35.00 | 40.00 |
| " Double " | " | 25.00 | 30.00 | 35.00 | 40.00 | 45.00 | 50.00 |
| " Triple " | | | | | | | |
| " Quadruple Feed | | | | | | | |
| " Five Feed | " | | | | | | 95.00 |
| " Six " | " | | ' | | ١ | ١ | 100.00 |

MANZEL FORCE AND SIGHT FEED OIL PUMPS

CLASS "HA"





Pig. 9351A

Pig. 9351B

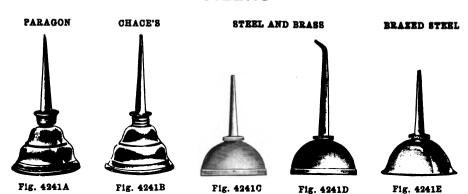
| Capa | city | | | | . pints | 2 | 4 | 5 | 6 | 8 |
|-------|-----------------------------|--------|--------|-----------------|---------|-------|-------------|-------|-------|-------|
| Price | Single Feed, N | ic¦:el | Plated | | .each | 16.00 | 20.00 | | 24.00 | |
| • | Double " | ** | ** | | " | | 26.00 | | 30.00 | 34.00 |
| - | Triple " | 44 | 46 | | " | ! | | 32.00 | 34.00 | 38.00 |
| 4. | Quadruple Feed | | 44 | | " | | . . | | 40.00 | 45.00 |
| | Quadruple Feed Five Feed | 44 | 46 | . . | | | | | | 52.00 |
| 44 | Six " | ** | 44 | | " | | | | | 60.00 |

The above are of the double plunger type, one plunger drawing the oil from the reservoir and forcing it through the sight glass, the second plunger forcing it to the engine cylinder. All of the working parts are in the interior out of dust and dirt. and work in the oil, the entire working mechanism being attached to the cover and arranged so that it can be removed in one-half minute's time. They have a constant sight feed, conveniently located where it can be plainly seen from all sides of the engine. No liquid is used in the sight glass, nor is it under pressure, and it can be taken out at any time without stopping the engine or pump. The feed is easily and accurately regulated while the engine is running, by turning the regulating screw to the right or left until adjusted to the proper amount. A lock nut holds the feed in place after adjustment. no further attention being required. Each feed is regulated independently. A hand attachment for use before starting the engine, or if more oil is needed momentarily while the engine is running - a gauge glass showing the amount of oil in the reservoira large strainer and filling space are a few of the other features which help to make our Class "HA" Oiler the most reliable, economical and convenient device for lubricating the cylinders of steam engines and pumps. The exterior is perfectly plain and smooth. easily kept clean, giving the pump a very handsome appearance. All workmanship and material are first class, and every pump is guaranteed to give positive lubrication under all conditions.





OILERS



PARAGON

| Number | 0 | 1 | 11/2 | 2 | 3 | 4 | 5 | 6 |
|---|------|------|------|------|-------------------|-------|------|------|
| Diameter inches Length of Nozzle " Price, Tin Bottom per dozen " Brass Bottom " | 23/6 | 25/8 | 27/8 | 31/4 | 31/16 | 41/8 | 43/8 | 43/4 |
| | 23/3 | 23/3 | 233 | 33/8 | 4 5 /2 | 59/16 | 59/6 | 59/6 |
| | 2.00 | 2.25 | 2.50 | 3.00 | 3.25 | 3.75 | 4.50 | 5.50 |
| | 2.25 | 2.50 | 3.00 | 3.50 | 4.00 | 4.50 | 5.50 | 6.50 |

CHACE'S

| Number | 00 | 0 | 1 | 11/2 | 2 | 3 | 4 | 5 | 6 |
|---|-------------------|---------------------|----------------|------|------|------------|-------|------|------|
| Diameterinches | $\frac{21}{32}$ | 23/6 | 25/8 | 27/8 | 332 | 233 | 4 3 2 | 43/8 | 43/4 |
| Length of Nozzle " Price, Tin Bottomper dozen | $2\frac{3}{1.00}$ | $\frac{23\%}{1.25}$ | $\frac{23}{6}$ | 1.75 | 2.00 | 4% 2.25 | 2.75 | 3.50 | 4.50 |
| " Brass Bottom " | 1.25 | 1.50 | 1.75 | 2.00 | 2.50 | 3.00 | 3.50 | 4.50 | 5.50 |

COPPER PLATED STEEL

| Number | 12 | 13 | 13A | 14 | 14A | 14AA | 14B | 15 | 15A | 16 |
|--------------------------------------|-------------------|------|--------------|------|------------------------------------|------------------------------------|------|--------|--------|--------|
| Capacitypints Diameterinches | 23/4 | 33 g | 33.8 32.8 | 33 8 | $\frac{\frac{1}{2}}{3\frac{3}{4}}$ | $\frac{\frac{1}{2}}{3\frac{3}{4}}$ | 33/4 | 1 41/4 | 1 41/4 | 1 41/4 |
| Length of Nozzle " Priceper dozen | $\frac{21}{4.50}$ | 5.50 | 6.00 | 6.50 | 7.50 | 8.00 | 8.50 | 9.25 | 9.75 | 10.50 |

SOLID BRASS OR NICKEL PLATED STEEL

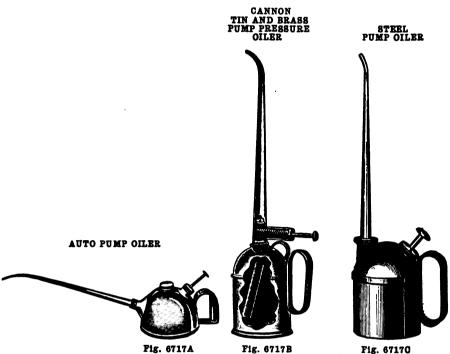
| Number | 120 | 130 | 140 | 140A | 140B | 150 | 160 |
|--------------------------------|--------------------|--------------|------|-------|-------|-------|-------|
| Capacity pints Diameter inches | 8/16 23/4 | 5/16 33°2 | 33/8 | 33/4 | 33/ | 1 | 1 |
| Length of Nozzle " | $2^{1}\frac{1}{2}$ | á° | 9 | 3 | 9 | 3 | 94 |
| Price per dozen | 6.50 | 8.00 | 9.20 | 10.20 | 11.25 | 12.00 | 14.00 |

BRAZED STEEL

| Number | 1703 | 1704 | 1706 | 1709 | 1903 | 1904 | 1906 | 1909 |
|--|------|--|--|-------------------|------------------------|----------------------|----------------------|----------------------|
| Capacity. pints Diameter inches Length of Nozzle " Price per dozen | 33/4 | $ \begin{array}{r} 1/2 \\ 334 \\ 4 \\ 6.00 \end{array} $ | 3 ³ / ₄ 6 6.50 | 33/4 9 7.00 | 1 41/2 3 7.75 | 1 4½ 4 8.00 | 1 4½ 6 8.50 | 1 4½ 9 9.00 |

The 6 and 9-inch spouts are furnished bent unless otherwise ordered.

OILERS



AUTO PUMP OU FRS

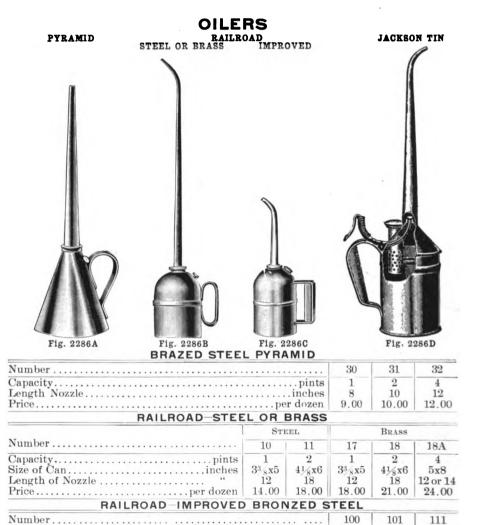
| 7010 | FUMF | JILENS | | | |
|----------------------------|----------------|-------------------------------------|------------------|------------------|----------------|
| Number | 800 | 801 | 802 | 803 | 804 |
| Capacity | 1/2 | 1/ ₂ 33/ ₄ | 334 | 1 | 1 |
| Nousle | 3 | 5 1 | 9 9 | 5 | 9 4 |
| Price, Copperizedper dozen | 23.00 28.50 | 23.50 29.00 | $24.00 \\ 29.50$ | $25.25 \\ 31.75$ | 25.75 32.00 |

CANNON TIN AND BRASS PUMP PRESSURE OILERS

| Number | 0 | 1 | 2 | 3 |
|------------------------------|-------|-------|-------|-------|
| Capacity pints Nearle inches | 1/2 | 1 | 11/2 | 2 |
| Price, Tin per dozen | 9.00 | 10.00 | 11.00 | 13.00 |
| Bress " | 14.00 | 16.00 | 18.00 | 21.00 |

STEEL PUMP OILERS

| Number 1 | 000 | 2000 | 3000 |
|--------------------------------|------|--------------------|------------|
| Capacity pints Diameter inches | 33 1 | $\frac{11_2}{33}$ | - <u>2</u> |
| Noszle | 9 8 | $\frac{12}{40.00}$ | 15 |



| Priceper dozen | | 1.00 | 18.00 | 20.00 |
|---|------------------|------|------------|------------------|
| JACKSON TIN | | | | , |
| Number | 1 | | 2 | 3 |
| Capacityquarts Length of Spoutinches Priceper dozen | 10 10 9.00 | 14 | 1 to 20 | 2 14 18.00 |

Capacity pints

Size of Caninches

Length of Nozzle.....

Jackson cans are suitable for all purposes, but are especially adapted to locomotives, automobiles and electric light and power plants.

These cans are made in the best possible manner and they are guaranteed as represented.

1

33/8x61/4

9

9

41/8x6

12

4

5x8

10 or 14

OILER SETS



Fig. 891A

| Price, 1 | Numb | er C30, Five | Pieces | s, Copper | Plated, | including | Tra | y | er set | 5.00 |
|----------|-----------|---------------------|---------|------------|-----------|------------|-------|---|---------|-------|
| 46 | " | C40, Six | " | | " | 46 | 66 | | 44 | 7.00 |
| ** | 46 | N50, Five | 46 | Nickel | ** | ** | 66 | | ** | 7.00 |
| ** | ** | N60, Six | " | " | " | " | " | | 44 | 10.00 |
| | | ENGINE | EERS | STEEL | SETS | , WITH | OVA | AL TRAY | | |
| Price, 1 | | er C35, Five | Pieces | , Copper | Plated, | including | g Tra | yp | er set | 7.00 |
| 46 | ** | C45, Six | " | " | ** | " | " | | " | 10.00 |
| a | 44 | N55, Five | 44 | Nickel | 44 | ** | ** | | 46 | 8.00 |
| HE . | 46 | N65, Six | 44 | " | " | " | " | | " | 11.00 |
| | | | EN | GINEER | S' BR | ASS SE | TS | | | |
| Price, 1 | Numb | er 30, Five P | ieces, | Brass, in | cluding | Tray | | p | er set | 6.00 |
| ** | 44 | 40, Six | " | " | " | " | | | " | 9.00 |
| 41 | 44 | 50, Five | 44 | | kel Plate | d, Includ | ing ' | Гrау | 66 | 8.00 |
| 44 | 44 | 60, Six | " | " " | " | " | | | " | 11.00 |
| | STE | AMBOAT | STEE | L SETS | , WITH | H ROUN | ID I | DOUBLE T | RAY | |
| Price, 1 | Numb | er C70, Five | Pieces | , Copper 1 | Plated, I | neluding | Tray | | oer set | 6.00 |
| 44 | ** | C80, Six | " | 74 | " | " | 44 | | " | 9.00 |
| ** | 44 | N90, Five | ** | Nickel | " | " | " | | " | 8.00 |
| ii. | ш | N100, Six | " | " | и | " | " | • | " | 11.00 |
| | ST | EAMBOAT | STE | EL SET | s, WIT | H OVA | L D | OUBLE TE | RAY | |
| Price, 1 | Numb | er C75, Five | Pieces | , Copper | Plated, | Including | Tray | 7 | | 9.00 |
| 16 | " | C85, Six | " | " | " | " | " | | " | 12.00 |
| a | ш | N95, Five | " | Nickel | " | 44 | " | | " | 10.00 |
| 44 | 16 | N105, Six | " | 44 | " | " | - 44 | | 44 | 13.00 |
| | | | STI | EAMBO | AT BR | ASS SE | TS | | | |
| | | | | | | | | | 1 | 7.00 |
| Price, 1 | Numb | er 70, Five P | | f Brass, I | ncluding | Trav | | | per set | |
| Price, 1 | Numb " | er 70, Five P | | f Brass, I | ncluding | Tray | | | per set | 10.00 |
| Price, 1 | Numb " | | | " | " | Tray | | | per set | 9.00 |
| Price, I | Numb " | 80, Six | ieces c | " | " | " | | | " | |
| Price, I | и | 80, Six 90, Five | ieces o | " Ni | ckel Pla | ted, Inclu | ding | | " | 9.00 |
| a a | a a | 80, Six 90, Five | ieces c | " Ni | ckel Plat | ed, Inclu | ding | | u u | 9.00 |

ENGINEERS' FILLERS, TALLOW POTS, ETC.

ZINC FILLER

STEEL AND BRASS FILLER



PERFECTION FILLER



Fig. 892A

BRONZE STEEL AND BRASS FILLERS

| Number | | | | | | | | |
|---|-------|----------|-------|-------|-------|----------|-------|-------|
| Capacity | 1 Pt. | 11/2 Pt. | 1 Qt. | 2 Qt. | 1 Pt. | 11/2 Pt. | 1 Qt. | 2 Qt. |
| Diameter inches Height " Price, Bronzed Steel per dozen | 418 | 43/4 | 5 | 6 | 41/8 | 434 | 5 | 6 |
| Height" | 31/2 | 4 | 5 | 6 | 31/2 | 4 | 5 | 6 |
| Price, Bronzed Steelper dozen | 14.00 | 17.00 | 20.00 | 24.00 | | | | |
| " Brass " | ' | ۱ | | | 18.00 | 22.00 | 30.00 | 34.00 |

ZINC AND PERFECTION TIN FILLERS

| Capacity | 1 Pt. | 1½Pt. | 1 Qt. | 2 Qt. |
|------------------------------|-------|-------|-------|-------|
| Price, Zinc Filler per dozen | 4.00 | 5.00 | 6.00 | 12.00 |
| " Perfection Tin " | | | 6.00 | 9.60 |

STEEL TALLOW POT

BRAZED STEEL TALLOW POT

TIN TALLOW POT









Fig. 892E

Fig. 892F

BRONZED STEEL TALLOW POTS

| ~ | | |
|----------|---------|----------|
| Number | 212 | 213 |
| Capacity | 1 Quart | 2 Quarts |
| Diameter | 5 | 6 |
| Height | 5 | 6 |
| Price | 21.00 | 25.00 |

BRAZED STEEL TALLOW POTS

| Number | 45H | 46H | 47H | 49H |
|-------------------|----------------|-----------------|----------------|-------------------|
| Capacityper dozen | J Qt. 13.00 | 1½ Qt. 14.00 | 2 Qt. 15.00 | 1 Gallon 18.00 |

TIN TALLOW POTS

| | | | |
|----------|------|-------------|-----------|
| Capacity | | | 16 Gallon |
| | | | |
| Price | | . per dozen | 24.00 |

TORCHES AND LAMPS



COPPER PLATED STEEL INSPECTORS' AND LOCOMOTIVE TORCHES

No. 27 AND 28



Fig. 655B

| Number | 26 | 27 | 28 |
|--|---------|----------|--------------|
| Diameterinches Height" | 2 15 | 4½ 4½ | 51/4 41/2 |
| Price, with Brass Cap and Tube per dozen | 12.00 | 12.00 | 15.00 |

STEEL JACKET LAMP



Fig. 655C

SEAMLESS STEEL LAMP



Fig. 655D

MALLEABLE IRON HAND LAMP



Fig. 655E

COPPER PLATED JACKET LAMPS

| Number | 20 | 201/2 | 21 |
|---|------|-------------------------------|-------|
| DiameterinchesCapacitypintsPriceper dozen | 33/8 | 3 ³ ⁄ ₄ | 4½ |
| | 5/16 | 1⁄ ₂ | 1½ |
| | 6.00 | 9.00 | 12.00 |

SEAMLESS COPPER PLATED STEEL LAMPS

| Number | 22 | 23 | 24 |
|--|-----------|------------------|-----------------------|
| Diameter inches Capacity pints Price per dozen | 31/4 1 | 4 1½ 12.00 | 47/8 21/4 15.00 |

MALLEABLE IRON HAND LAMPS

| Price, with Oil Tubes, Kerosene Screw | per dozen | 5.00 |
|---------------------------------------|-----------|------|

OIL CANS, ETC.

WITH SPOUT



Fig. 907A

WITH PAUCET



Fig. 907B

WOOD JACKETS



Fig. 907C

| Capacitygallons | | | 3 | 5 | 10 |
|---|------|------|------|-------|-------|
| Price, Galvanized, with Spoutper dozen | 2.20 | 3.75 | 5.00 | 5.60 | |
| " " Faucet " | l | | 6.00 | 6.60 | 12.50 |
| Price, Galvanized, with Spoutper dozen " " Faucet" " Wood Jacket" | 4.80 | 6.60 | 8.40 | 10.20 | 18.00 |

PUNNEL



Fig. 907D

MEASURE



Fig. 907E

CAN SCREW

Fig. 907F

FUNNELS-Galvanized Iron or XXXX Tin

| Capacity | 1 Qt. | 2 Qt. | 1 Gal. | 2 Gal. | .3 Gal. | 5 Gal. |
|----------|-------|-------|--------|--------|---------|--------|
| Price | .50 | .60 | .75 | 1.00 | 1.15 | 1.25 |

MEASURES

| Capacity | 1 Pt. | 1 Qt. | 2 Qt. | 1 Gal. | 2 Gal. | 3 Gal. | 5 Gal. |
|-----------|-------|-------|-------|--------|--------|--------|--------|
| Priceeach | .60 | . 75 | .90 | 1.25 | 2.00 | 3.00 | 3.25 |

CAN SCREWS

| Sizeinches | | | | | | | |
|-----------------------|------|------|------|-------|-------|-------|-------|
| Price, Zinc per gross | 4.00 | 4.50 | 6.00 | 8.00 | 12.00 | 16.00 | 20.00 |
| " Brass " | 4.50 | 5.50 | 7.50 | 10.00 | 13.00 | 17.00 | 21.00 |

WALKER'S OIL PUMPS

| Number | 3153 | 3154 | 3155 | 3156 | 3157 | 3158 |
|-----------------|------|--------------------|------|------|------|------|
| Lengthfeet | 3 | 4 | 5 | 6 | 7 | 8 |
| Diameter inches | 11/1 | $\frac{114}{1.50}$ | 11/4 | 11/4 | 11/4 | 11/2 |
| Priceeach | 1.50 | 1.50 | 1.63 | 1.88 | 2.13 | 2.38 |

OIL, WASTE, ASH CANS, ETC.

FACTORY DISPENSING OIL CANS









Fig. 5323A

Fig. 5323B

Fig. 5323C

FACTORY DISPENSING OIL CANS

| Number | 73 | 75 | 80 |
|-----------------------------|----|---------|----|
| Capacity gallons Price each | | 5 | 10 |
| Priceeach | | • • • • | |

GALVANIZED OILY WASTE CANS

| Number | 1-0 | 2-0 | 3-0 |
|----------------|---------|---------|----------|
| Sizeinches | 113/x13 | 121/x14 | 131/6×15 |
| Priceper dozen | 18.00 | 24.00 | 30.00 |

WOOD STAVE



STEEL BARREL



Fig. 5323D



Fig. 5323E ASH CANS



Fig. 5323F

| Sizeinches | 15 x 26 | 17 x 26 | 18 x 26 | 20 x 26 | 21 x 26 |
|-------------------------------|---------|---------|---------|---------|---------|
| Price, Wood Staveper dozen | 40.00 | 46.00 | 52.00 | 58.00 | |
| " Corrugated, without Cover " | 48.00 | | 60.00 | | 72.00 |
| - " with " " | 54.00 | | 67.00 | | 80.00 |

STEEL BARRELS

| Size inches | | | | | | | _ | 20 x 30 | • | | |
|-------------|------|------|----------|------|------|----------|----------|-----------|------|----------|------|
| Body Gauge | 18 | 18 | 16 16 | 16 | 14 | 12 12 | 18 16 | 16 1.1 | 14 | 12 12 | 10 |
| Price each | 4.50 | 4.60 | 4.90 | 5.10 | 5.80 | 6.80 | 5.10 | 6.80 | 6.50 | 7.50 | 9.00 |

For heavy iron handles, add 50 cents per barrel.
For 1/2-inch round iron stationary handles, add 1.00 per barrel.

WHITE STAR OIL FILTERS

ROUND TYPE



Fig. 8353A

DUPLEX TYPE



Fig. 8353B

In writing for information kindly state horsepower, type and number of engine in use; whether filter can be installed below engine room floor or not; whether bearings are equipped with oil feed fixtures, and if so, state if they are connected with brass piping or not. Also state number of oil cups in each engine, and, if possible, the amount of oil used per hour, or per day, in hand lubrication. Also specify whether or not the oil has a tendency toward emulsifying.

ROUND TYPE

| No. | Filtering Capacity | Н | OLDING CAPACI GALLONS | TY | Shipping Weight | Price |
|-----|-------------------------|-------------|--------------------------|-------------|--------------------|--------|
| мо. | Gallons per 24 Hours | Pure Oil | Dirty Oil | Water | Pounds | Each |
| 2 | 20 | 71.5 | 51., | 5 | 115 | *35.00 |
| 4 | 35 | 91 2 | $7\frac{1}{2}$ | 6^{1}_{2} | 127 | 50.00 |
| 5 | 50 | 12 | 10 | 9 | 142 | 60.00 |
| 7 | 65 | 15 | 13 | 12 | 165 | 75.00 |
| 10 | 80 | 19 | 17 | 16 | 190 | 85.00 |
| 12 | 100 | 25 | 18 | 20 | 225 | 100.00 |

AND MULTIPLEX TYPES 95.00 125.00 20 23 25 150.00 300.00 400,00 500,00 600.00 800.00 1000.00 1200.00 1500.00 1800.00

*Nos. 2 to 12, list price is for hand operation. When Round Type Filters are fitted with extra attachment for system operation, add 10.00 to list prices. To meet unusual conditions, special filters are made, and, where necessary can furnish eccentric cylinders. Prices and full information and dimension sheet on application.

CHIMNEYS AND GLOBES LAMP CHIMNEYS







ROCHESTER



SUN CRIMP TOP AND BANNER CHIMNEYS

| Number | 1 | 2 |
|---|------|-----------|
| Diameter of Bottom inches Price, Sun Crimp Top. per dozen | 21/2 | 3 1.20 |
| " Banner " | 1.00 | 1.50 |
| CUN CRIME TOR CHIMNEYO ACCORTED NO. | | - |

| Price, 3 dozen of Each in a Case | 1 | 6.00 |
|----------------------------------|---|------|
| ROCHESTER CHIMNEYS | | |

3 Diameter of Bottominches 21/6 4 Height . 10 12 2.00 4.00

HEAD LIGHT CHIMNEYS-No. 5

Price. Diameter of Bottom 2% inches, Length 10 inches...... per dozen 4.00

LANTERN GLOBES PITALL VULCAN



PIONEER No. 3

| 1 | | |
|---|--------|---|
| П | DIETZ | |
| 1 | FITALL | |
| A | | |
| | | 1 |
| M | | - |





Fig. 1904E

Fig. 1904F

Fig. 1904G

| Kind | Fitall | Vulcan | Pioneer |
|--------------|--------|--------|---------|
| Price, White | 1.00 | 1.50 | 6.50 |
| " Ruby" | 2.75 | 4.00 | 60.00 |

DIETZ LANTERNS AND LAMPS ROYAL No. 2 BLIZZARD







Fig. 8990A

Fig. 8990B

Fig. 8990C

| Description | Royal | Victor | No. 2 Blizzard Cold Blast |
|--|-------|--------|------------------------------|
| Price, Bright Tin with White Globe per dozen | 8.50 | 6.25 | 10.50 |
| | 10.15 | 7.90 | 12.75 |

STANDARD RAILROAD No. 39

BEACON LIGHTS Nos. 30 and 60









Fig. 8990D

Fig. 8990E

Fig. 8990F

| Description | ription Standard Railroad Beacon Lights | | | *Pioneer Street Lamp |
|-----------------|---|-------|-------|-------------------------|
| Number | 39 | 30 | . 60 | |
| Price per dozen | 12.00 | 30.00 | 68.00 | |

^{*}Pioneer street lamps, 5.00 each.

HEADLIGHTS

14-INCH LOCOMOTIVE



10-INCH ELECTRIC



No. 6-14-INCH OIL



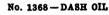
Fig. 8266A

Fig. 8266B

Fig. 8266C

| Price, | 14-i | | Locomotiveeach | 13.00 |
|--------|------|----|----------------|-------|
| 4 ′ | 10 | 44 | Electric " | 15.00 |
| 4 | 14 | 66 | Oil | 30.00 |

No. 584 - OIL



No. 7 - DASH OIL



Fig. 8266D



Fig. 8266E



Fig. 8266F

| No. 584— | OIL | | | |
|------------|-------|-------|-------|-------|
| Sizeinches | 16 | 18 | 20 | 23 |
| Price each | 33.00 | 35.00 | 37.50 | 40.00 |

| Priceeach | 33.00 | 35.00 | 37.50 |
|----------------|--------|-------|-------|
| No. 1368 — DAS | SH OIL | | |

| Price, 14-incheach | 35.00 |
|--------------------|-------|
| | |

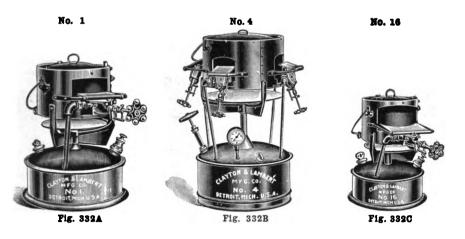
| No. 7 - DASH OIL | |
|---|-------|
| Price, 12-inch with Brass Nickel Plated Reflectoreach | |
| | 24.00 |

GASOLINE TORCHES No. 1 No. 6 No. 7 Pig. 7200B Fig. 7200C Fig. 7200D Fig. 7200A No. 9 Nos. 16 and 29 No. 8 No. 18 Fig. 7200E Fig. 7200F Fig. 7200G Fig. 7200H No. 19 No. 31 No. 37 Fig. 7200L Fig. 7200J Fig. 7200K

| Number | 1 | 2 | *6 | 7 | 8 | 9 | 16 | *17 |
|---------------------------|-----------|-----------|------------------|-----------|-----------|-----------|-----------|-----------|
| Capacity pints Price | | 2 3.75 | 2 4.00 | 1 3.25 | 3.00 | 3.50 | 3.50 | 2 3.75 |
| Number | 18 | *19 | 29 | *30 | 31 | *32 | 37 | *38 |
| Capacity pints Price each | 1 3.00 | 1 3.25 | $\frac{2}{3.25}$ | 3.50 | 2 3.75 | 2 4.00 | 1 3.25 | 1 3.50 |

^{*}Same Torch as next lowest number except with Hook and Support for soldering copper.

GASOLINE FURNACES



| Number | 1 | 5 | 2 | 3 | 4 | 16 |
|------------|------|------|-------|---------------|-------|------|
| Capacity | 7 | 5 | 16 | 24 | 40 | 8 |
| Price each | 6.00 | 4.50 | 20.00 | 2 5.00 | 30.00 | 6.00 |

No. 5 is same as No. 1 except smaller.

Nos. 2, 3 and 4 are same style, varying in size and having 2, 3 and 4 burners respectively.





No. 20

2D Fig. 332E

| Number | 10 | 20 |
|--|------|---------------------|
| Capacity pints Price with Large Shield only each | 8 | 8 |
| " Both Shields each | 4.00 | $\frac{4.00}{4.25}$ |

No. 20 is same as No. 10, except that it is fitted with an automatic brass air pump.

IRON OR STEEL WROUGHT PIPE

MERCHANT PIPE

This term is used to indicate the regular pipe of the market, and such orders are usually filled by the shipment of soft wrought steel pipe. The weight of merchant pipe will usually be found to be about 5 per cent less than card weight.

FULL WEIGHT PIPE

This term is used where pipe is required of about card weight. ALL such pipe is made from plates which are expected to produce pipe of card weight, and most of such pipe will run full card to a little above card, but owing to exigencies of manufacture some lengths may be below card, but never to the extent of more than 5 per cent.

LARGE O. D. PIPE

A term used to designate all pipe larger than 12-inch. Pipe 12-inch and smaller is known by the nominal internal diameter, but all larger sizes by their external diameter, so that 14-inch pipe if %-inch thick, is 13½-inch inside, and 20-inch pipe of same thickness is 19½-inch inside.

The terms "Merchant" or "Standard Pipe" are not applicable to "Large O. D. Pipe," as the latter is made in various weights and should properly be ordered by the thickness of the metal and

the outside diameter.

When ordering large pipe threaded, it must be remembered that \(^1_4\)-inch metal is too light to

thread, is being the minimum thickness.

Orders received by us for large outside diameter pipe, wherein the thickness of metal is not specified, are filled with \(\frac{1}{2}\)-inch thick metal.

This pipe is shipped with plain ends, unless definitely ordered "threaded" or "threaded and coupled"

coupled.

EXTRA STRONG PIPE

This term designates a heavy pipe from ¹s to 12 inches only, made of either puddled wrought iron or soft steel. Unless directed to the contrary, we usually ship wrought steel pipe. Extra strong pipe is always shipped with plain ends and without couplings, unless we receive instructions to thread and couple, for which there is an extra charge.

This term when applied to pipe larger than 8-inch is somewhat indefinite, as 9, 10 and 12-inch are made both 7.6 and 4-inch thick. We carry these sizes in stock 12-inch thick, and always furnish

that thickness on open orders.

DOUBLE EXTRA STRONG PIPE

This pipe is approximately twice as heavy as Extra Strong, and is made from ½ to 8-inch in both wrought iron and steel. It is difficult, however, to find any quantity in "Wrought Iron." and our stock is usually soft wrought steel. This pipe is shipped with plain ends, without couplings, unless we receive orders to thread and couple, for which there is an extra charge.

PIPE TRADE CUSTOMS

Every piece of pipe, tubing, casing, boiler tubing, line pipe and drive pipe is carefully tested, but as it is impossible to always detect imperfections, the only guarantee that is given is to replace such goods as prove defective. Under no circumstances is the seller responsible for any damages beyond the price of the goods. No charges for labor or expense required to repair defective goods or occasioned by them will be allowed. If the goods are defective, the measure of damages is the price of the defective pieces.

Claims for the street and additional contents of the defective pieces.

Claims for shortage or deductions for erroneous charges must be promptly presented or will not be allowed.

The outside diameter of goods heavier than "sta.,dard" is the same as standard, the extra thickness being on the inside, so that the different weights of the same size use the same coupling. Special goods made to specifications, where buyer is to inspect, must be inspected and accepted before shipment is made. After shipment is made our responsibility ceases.

PROPORTIONATE WATER WORKING PRESSURES

For convenience in determining the approximate or admissable Water Working Pressures to which Valves and Fittings may be subjected, proportionate to or based on the designated Steam Working Pressures, we suggest the following conservative rule, although a much greater range may be safely used with comparatively small sizes of Valves and Fittings.

To the steam working pressure, for sizes 12-inch and smaller, add 40 per cent; for sizes 14-inch

and larger, add 20 per cent.



STANDARD STEAM, GAS, AND WATER PIPE

BLACK AND GALVANIZED

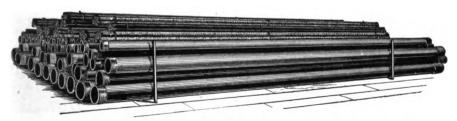


Fig. 1A

| Size Inches Inside Diameter | Price Black or Galvanized Per Foot | Nominal Thickness Inches | Nominal Weight per Foot Pounds | Number of Threads per Inch of Screw |
|--|------------------------------------|--------------------------------|---|--|
| | .051/4 | .068 | .24 | 27 |
| } /s | .051/2 | .088 | .42 | 18 |
| 73 | .051/2 | .091 | .42 | 18 |
| 78 | | | .56 | |
| 22 | .081/4 | .109 | .84 | 14 |
| .% | .11.1% | .113 | 1.12 | 14 |
| 1 | .161/2 | .134 | 1.67 | 111/4 |
| 11/4 | .22½ .27 .36 | .140 | 2.24 | 111/4 |
| 11/2 | .27 | .145 | 2.68 | 111/2 |
| 2 | .36 | .154 | 3.61 | 111/2 |
| 21/4 | .571/2 | .204 | 5.74 | 8 |
| 3 - | .751/4 | .217 | 7.54 | 8 |
| 31.4 | .75½ .95 | .226 | 9.00 | 8 |
| 4' | 1.08 | .237 | 10.66 | 8 |
| 416 | 1.30 | .246 | 12.49 | 8 |
| 20 21 11 11 22 21 22 33 4 4 5 6 7 8 8 9 | 1.45 | .259 | 14.50 | 8 |
| Ř. | 1.88 | .280 | 18.76 | 8 |
| ž | 2.35 | .301 | 23.27 | Ř |
| ġ | 2.50 | .276 | 25.00 | 8 |
| ě | 2.82 | .322 | 28.18 | Ř |
| ă | 3.40 | .344 | 33.70 | Ř |
| 10 | 3.20 | .278 | 32.00 | |
| 10 | 3.50 | | 35.00 | |
| 10 | | .306 | | |
| 10 | 4.00 | .366 | 40.00 | 9 |
| 11 12 | 4.50 | .375 | 45.00 | ğ |
| 12 | 4.50 | .328 | 45.00 | 8 |
| 12 | 4.90 | .375 | 49.00 | 888888888888888888888888888888888888888 |
| 13-14OD | 5.75 | .375 | 56.10 | 8 |
| 14-15OD | 6.50 | .375 | 60.70 | 8 |
| 15-16OD | 7.00 | .375 | 64 .90 | 8 |

Unless otherwise ordered, black pipe, random lengths, with threads and couplings will be shipped.

For cut lengths, an extra charge will be made above random lengths.

For pipe smoothed on the inside, known as plugged and reamed, an extra charge will be made above regular pipe.

For galvanized pipe, an extra charge will be made above black. For asphalted pipe, an extra charge will be made above black.

STEAM, GAS, AND WATER PIPE

BLACK EXTRA STRONG

| Size Inches | Price, Black Per Foot | Nominal Inside Diameter Inches | Nominal Outside Diameter Inches | Thickness Inches | Nominal Weight Per Foot Pounds |
|---------------------------------|--------------------------|---|--|---------------------|---|
| 1/8 | .11 | .205 | .405 | .100 | .29 |
| 1/2 | .11 | .294 | .540 | .123 | .54 |
| 8% | .11 | .421 | .675 | .127 | .74 |
| íå | .12 | .542 | .840 | .149 | 1.09 |
| 1/8 1/4 3/8 1/2 3/4 | .15 | .736 | 1.050 | .157 | 1.39 |
| 1′* | .22 | .951 | 1.315 | .182 | 2.17 |
| 114 | .30 | 1.272 | 1.660 | .194 | 3.00 |
| $\frac{114}{112}$ | .36 | 1.494 | 1.900 | .203 | 3.63 |
| 2' | .50 | 1.933 | 2.375 | .221 | 5.02 |
| 21/2 | .81 | 2.315 | 2.875 | .280 | 7.67 |
| 3 | 1.05 | 2.892 | 3.500 | .304 | 10.25 |
| 31/2 | 1.33 | 3.358 | 4.000 | .321 | 12.47 |
| 4′ | 1.50 | 3.818 | 4.500 | .341 | 14.97 |
| 41/2 | 1.95 | 4.280 | 5.000 | .360 | 18.22 |
| 5 1 | 2.16 | 4.813 | 5.563 | .375 | 20.54 |
| 5 ° 6 | 2.90 | 5.750 | 6.625 | .437 | 28.58 |
| 7 | 3.80 | 6.625 | 7.625 | .500 | 37.67 |
| 8 | 4.30 | 7.625 | 8.625 | .500 | 43.00 |
| 9 | 5.00 | 8.625 | 9.625 | .500 | 48.73 |
| 10 | 5.50 | 9.750 | 10.750 | .500 | 54.74 |
| īĭ | 6.25 | 10.750 | 11.750 | .500 | 60.08 |
| | 6.50 | 11.750 | 12.750 | .500 | 65.42 |

DOUBLE EXTRA STRONG

| Sise Inches | Price, Black Per Foot | Nominal Inside Diameter Inches | Nominal Outside Diameter Inches | Thickness Inches | Nominal Weight Per Foot Pounds |
|---------------------|--------------------------|---|--|---------------------|---|
| 1/2 | .25 | .244 | .84 | .298 | 1.70 |
| 1/2 3/4 | .30 | .422 | 1.05 | .314 | 2.44 |
| 1 | .37 | .587 | 1.315 | .364 | 3.65 |
| 1 1/4 1 1/2 2 | .52 | .885 | 1.66 | .388 | 5.20 |
| 11/2 | .65 | 1.088 | 1.90 | .406 | 6.4C |
| 2 | .95 | 1.491 | 2.375 | .442 | 9.02 |
| $2\frac{1}{2}$ | 1.37 | 1.755 | 2.875 | .560 | 13.68 |
| 3 | 1.92 | 2.284 | 3.50 | .608 | 18.56 |
| 31/2 | 2.45 | 2.716 | 4.00 | .642 | 22.75 |
| 4 | 2.85 | 3.136 | 4.50 | .682 | 27.48 |
| 41/2 | 3.30 | 3.564 | 5.00 | .718 | 32.53 |
| 5 | 3.80 | 4.063 | 5.563 | .75 | 38.12 |
| 6 | 5.30 | 4.875 | 6.625 | .875 | 53.11 |
| 7 | 6.25 | 5.875 | 7.625 | .875 | 62.38 |
| 8 | 7.20 | 6.875 | 8.625 | .875 | 71.62 |

Extra Strong and Double Extra Strong Pipe will be shipped in random lengths and plain ends, unless otherwise ordered. An extra charge will be made for threads and couplings.

For cut lengths, an extra charge will be made above random.

For galvanized or asphalted pipe, an extra charge will be made above black.



SPECIAL PIPE CUT TO ORDER

DIAGRAM SHOWING SCREWED VALVE AND FITTINGS

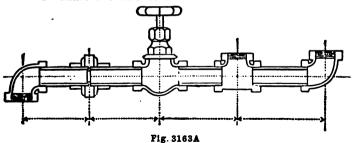
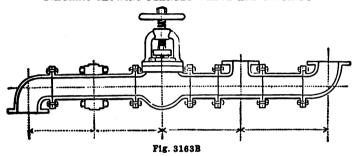


DIAGRAM SHOWING FLANGED VALVE AND FITTINGS



We are equipped with the most improved facilities for cutting, threading and fitting all sizes of pipe to sketch.

In laying out work of this kind great care should be taken in making sketches. All measurements should be given center to center, as shown in above diagrams. It is also necessary to know for what purpose the pipe is to be used and pressure required to stand.

CUTTING STANDARD PIPE THREADS

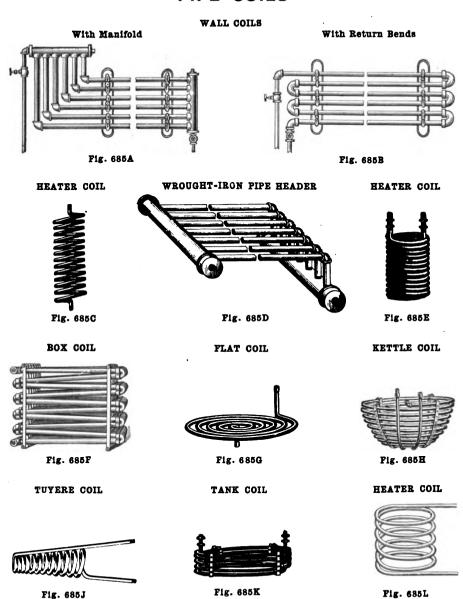
| Sizeinches | 1.8 | 14 | 38 | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 |
|------------|-----|------|----|------|----|----|-----|------|---|------|
| Priceeach | | | | | | | | | | |
| Sizeinches | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 |
| Priceeach | | | | | | | | | | |
| Sizeinches | 12 | 14 | 15 | 16 | 18 | 20 | 22 | 24 | | Ī |
| Priceeach | | | | | | | | | | |

LOCKNUT THREADS

| Size inches | 1/4 | 3/8 | 1/2 | 34 | 1 | $\bar{1^1}_4$ | 11/2 | 2 | 212 | 3 | 314 | 4 |
|-------------|-----|-----|-----|-----|-----|---------------|------|-----|-----|-----|-----|-----|
| Price each | .10 | .10 | .10 | .10 | .12 | .14 | .16 | .20 | .30 | .40 | .50 | .70 |

LOCKNUT NIPPLES Made to Order and Charged as Cut Pipe, Threads Extra

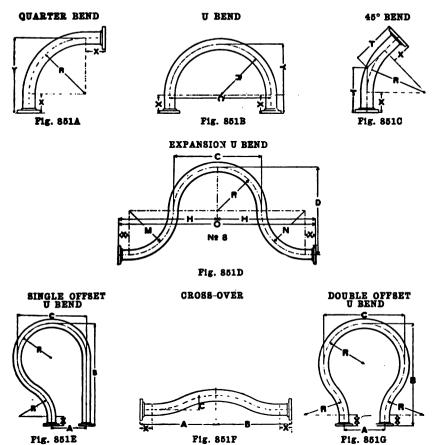
PIPE COILS



Our facilities for cutting, threading, drilling, and tapping wrought-iron pipe used in construction of coils, etc., are complete in every detail. Estimates furnished on application.

PIPE BENDS

MADE FROM LAP WELDED STEEL PIPE



We are prepared to bend large pipe in any desired form within the following limits:

The radius of any bend should not be less than five diameters of the pipe, and a larger radius is much preferable. The length "X" of straight pipe at each end of bend should be not less than as follows:

DRIVE PIPE, LINE PIPE, AND TUBING

| | | DRIVE | . PIPE | | |
|--------------------------------------|--------------------------------|--------------------------------------|--|--|-------------------|
| Nominal Inside Diameter Inches | Nominal Thickness Inches | Nominal Weight Per Foot Pounds | Number Threads Per Inch of Screw | Outside Diameter of Couplings Inches | Price Per Foot |
| 2 21/2 | .154 .204 | 3.609 5.739 | 111/2 | 27/8 3 15 | tion. |
| 3 3½ | .217 .226 .237 | 7.536 9.001 10.665 | 8 8 8 | 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | Application |
| 4½ 5 | .246 .259 | 12.49 14.502 | 8 | 51½ 6¾ | on Ap |
| 6 7 | .280 .301 | 18.76 23.271 | 8 8 | 77/16 81/2 | Ргісев о |
| 9 10 | .322 .344 .366 | 28.177 33.701 40.065 | 8 8 | 91 <u>7</u> 10 <u>17</u> 11 % | Vet Pri |
| 10 | 275 | 40.00 | l ŏ | 1 1972 | 7 |

LINE PIPE

| Nominal Inside Diameter Inches | Thickness Inches | Nominal Weight Per Foot Pounds | Number Threads Per Inch of Screw | Outside Diameter of Couplings Inches | Price Per Foot |
|---|--|---|---|--|----------------------------|
| 2 21/2 3 31/2 4 41/2 5 6 7 8 8 9 10 10 10 12 | .154 .204 .217 .226 .237 .246 .259 .280 .301 .291 .322 .344 .2865 .3145 .366 .340 | 3.609 5.739 7.536 9.001 10.665 12.49 14.502 18.762 23.271 25.00 28.177 33.701 32.00 35.00 40.065 45.00 | 11½ 8 8 8 8 8 8 8 8 8 8 | 27/8 3 15 4 1/8 4 1/8 5 3/6 6 7 15 8 1/2 9 1/2 10 17/8 11 7/8 11 7/8 11 7/8 | Net Prices on Application. |
| 12 | .375 | 48.985 | 8 | 137/8 | |

TUBING

| | | IUE | SING | | |
|--------------------------------------|---------------------|--------------------------------------|--|--|-------------------|
| Nominal Inside Diameter Inches | Thickness Inches | Nominal Weight Per Foot Pounds | Number Threads Per Inch of Screw | Outside Diameter of Couplings Inches | Price Per Foot |
| 2 | .1725 | 4.00 | 11½ | 27/8 | p. |
| $2\frac{1}{2}$ | .204 | 5.739 | 111/2 | 31/2 | 10 |
| 3 | .217 | 7.536 | 111/2 | 4.5 | at |
| 31/2 | .226 | 9.001 | 8 | 411/6 | lic |
| 4 | .237 | 10.665 | 8 | 53% | Application |
| 41/2 | .246 | 12.49 | 8 | 511/16 | A _I |
| 5 | .259 | 14.502 | 8 | 63/8 | g |
| 6 | .280 | 18.76 | 8 | $7\frac{13}{32}$ | on |
| 7 | .301 | 23.271 | 8 | | 68 |
| 8 | .322 | 28.177 | 8 | | Prices |
| 9 | .344 | 33.701 | 8 | | H |
| 10 | .366 | 40.065 | 8 | | Net |
| 12 | .375 | 49.98 | 8 | | Z |

LAP WELDED CASING WITH PLAIN ENDS

SCREW AND SOCKET JOINT







Fig. 3953A

Pig. 3953B

| Nominal Inside Price Black Doubted Dameter Inches Per Foot Dameter Inches Dam | • | 16. 9909 E | | | | | | |
|--|--------------------|------------|-------------------------------|----------|-------------|--|--|--|
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | Inside Diameter | | Outside Diameter Inches | per Foot | per Inch | | | |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | 9 | 23 | 21, | 2.22 | 14 | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 517 | | $\frac{5}{12}$ | | | | | |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | 2:4 | . 20 | 522 | | | | | |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | 21/2 | .32 | 274 | | | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 23/4 | | . 3 | | 14 | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 3 - | .41 | 31/4 | 4.10 | . 14 | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 31.7 | | 31% | | 14 | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 212 | .10 | 33 | | | | | |
| 4 60 4½ 6.00 14 4½ 6.36 14 1.00 4½ 9.38 14 4½ 9.38 14 1.00 4½ 9.38 14 4½ 1.00 4¾ 9.39 14 4½ 1.00 4¾ 9.39 14 5 82 514 8.20 14 5 1.00 5¼ 9.86 14 5 1.30 5¼ 9.86 14 5 1.30 5¼ 12.80 11½ 5 1.50 5¼ 15.88 11½ 5 1.50 5¼ 12.49 11½ 5% 1.05 6 10.46 14 4 1.55 1.00 6 12.04 11½ 5% 1.40 6 14.20 11½ 55% 1.40 6 16.70 11½ 6¼ 1.16 6% 17.02 | 372 | | | | | | | |
| 4 60 4½ 6.00 14 4½ 6.36 14 1.00 4½ 9.38 14 4½ 9.38 14 1.00 4½ 9.38 14 4½ 1.00 4¾ 9.39 14 4½ 1.00 4¾ 9.39 14 5 82 514 8.20 14 5 1.00 5¼ 9.86 14 5 1.30 5¼ 9.86 14 5 1.30 5¼ 12.80 11½ 5 1.50 5¼ 15.88 11½ 5 1.50 5¼ 12.49 11½ 5% 1.05 6 10.46 14 4 1.55 1.00 6 12.04 11½ 5% 1.40 6 14.20 11½ 55% 1.40 6 16.70 11½ 6¼ 1.16 6% 17.02 | 3% | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 4 | | 41/4 | | 14 | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 41/ | .64 | 416 | 6.36 | 14 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 417 | | 412 | | 1.1 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 174 | | 432 | | | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 4/2 | | 4.4 | | | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 41/2 | | 434 | | | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 43/ | .78 | 5 | 7.80 | 14 | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 5 - | 82 | 514 | 8.20 | 14 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | ř | | 517 | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | ភ្ | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | б | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 5 | | $1 5\frac{1}{4}$ | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 534 | .87 | 51/3 | 8.62 | 14 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 58/ | | 512 | | 111/ | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 5 716 5 5 7 | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 598 | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 55 g | | 6 | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 55 _{/s} | 1.40 | 6 | 14.20 | 111/2 | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 55 % | 1.60 | 6 | 16.70 | 1116 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 61? | | 65% | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 054 | | C5 2 | | | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 0:4 | | 09/8 | | | | | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | $6^{1}4$ | | 65/8 | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 65% | 1.24 | 7 | 12.34 | 14 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 65 % | 1 75 | 7 | 17.51 | 111% and 10 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 712 | | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | 0 78 | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | 0 | | 1172 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 75/8 | | 8 | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 81/4 | 1.61 | 85/8 | 16.07 | 111/2 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | 2.00 | 85% | 20.10 | 1116 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 243 | | 852 | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 2.4 | | 0/8 | | 111/ | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | 11.2 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 95/8 | | | | 1112 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 105% | 2.68 | | 26.72 | 1116 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 115% | 3.05 | 12 | 30.35 | 1115 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | /0 | | | | 1112 | | | |
| $14\sqrt{2}$ 4.80 15 47.70 $11\sqrt{2}$ | | | | | 111 | | | |
| 141/2 4.80 15 47.70 111/2 | | | | | 11/2 | | | |
| **** F OF 10 71 00 111 | $14\frac{1}{2}$ | | | | 111/2 | | | |
| 15½ 5,25 16 51.30 11½ | $15\frac{1}{2}$ | 5.25 | 16 | 51.30 | 1113 | | | |

Where 2 threads are shown specify which thread is wanted. For cut lengths, an extra charge will be made above random. Unless otherwise ordered plain end casing will be sent.



PIPE AND BOILER TUBES

LARGE O. D. PIPE-PLAIN ENDS



Fig. 3415A

| Size O. D. Inches | 1/4-Inch Thick Per Foot | %6-Inch Thick Per Foot | %-Inch Thick Per Foot | 7/6-Inch Thick Per Foot | ⅓-Inch Thick Per Foot |
|----------------------|----------------------------|---------------------------|--------------------------|----------------------------|--------------------------|
| 14 | 3.85 | 4.80 | 5.75 | 6.65 | 7.60 |
| 15 | 4.15 | 5.15 | 6.15 | 7.15 | 8.15 |
| 16 | 4.40 | 5.50 | 6,60 | 7.65 | 8.70 |
| 17 | 4.70 | 5.85 | 7.00 | 8.15 | 9.25 |
| 18 | 4.95 | 6.20 | 7.40 | 8.60 | 9.80 |
| 20 | 5.50 | 6.90 | 8.25 | 9.60 | 10.95 |
| 21 | | 7.25 | 8.65 | 10.10 | 11.50 |
| 22 | | 7.60 | 9.10 | 10.60 | 12.10 |
| 24 | | | 9.95 | 11.60 | 13.15 |
| 26 | | | 11.30 | 13.15 | 14.95 |
| 2 8 | | | 12.15 | 14.15 | 16.15 |
| 30 | 1 | • • • • • | | 15.20 | . 17.65 |

STANDARD STEEL AND IRON BOILER TUBES

| | STANDARD | THICKNESS | | | | PRICE 1 | er Fo | от | | | |
|----------------------------|-----------------------|---------------|-----------------------|-------|----------------|---------------|-----------------|-----------------|-----------------|--------------|-----------------|
| Outside Diam. Inches | Nearest Birmingham | Inches | Standard Thickness | | Extra Gauge | Two Wire G | Extra lauges | Three Wire C | Extra Sauges | Four Wire | Extra Gauges |
| | Wire Gauge | | Steel or Iron | Steel | Iron | Steel | Iron | Steel | Iron | Steel | Iron |
| 1 | 13 | .095 | .30 | .35 | .35 | .38 | .38 | .42 | .42 | . 45 | .45 |
| 11/4 | 13 | .095 | .28 | .33 | .33 | .36 | .36 | .39 | .39 | .43 | .43 |
| 11/4 11/2 13/4 | 13 | .095 | .27 | .32 | .32 | .34 | .34 | 38 | .38 | .42 | .42 |
| 134 | 13 | .095 | .22 | .26 | .26 | .28 | .30 | .31 | .33 | .34 | .36 |
| 2 | 13 | . 0 95 | .20 | .23 | .24 | .26 | .28 | .28 | .32 | .31 | .36 |
| 21/4 | 13 | .095 | .24 | .27 | .29 | .31 | .33 | .34 | .37 | .37 | .40 |
| $2\frac{1}{2}$ | 12 | .109 | .28 | ,31 | .34 | .35 | .39 | .38 | .44 | .42 | .49 |
| $\frac{212}{234}$ | 12 | .109 | .34 | .38 | .41 | .42 | .47 | .46 | .54 | .51 | .60 |
| 3 | 12 | , 109 | .35 | .39 | .42 | .43 | .49 | .48 | .56 | .53 | .63 |
| 314 31/2 33/4 | 11 | . 120 | .40 | .45 | .48 | .50 | .55 | .55 | .63 | .60 | .70 |
| 31/2 | 11 | .120 | .44 | .49 | .53 | .55 | .61 | .61 | .69 | .66 | .77 |
| 3¾ | 11 | . 120 | .50 | .58 | .59 | .65 | .68 | .71 | .76 | .80 | .85 |
| 4 | 10 | .134 | .55 | .61 | .65 | .68 | .74 | .74 | .83 | .83 | .92 |
| 41⁄2 | 10 | .134 | .62 | .69 | .73 | .77 | .83 | . 83 | .94 | . 93 | 1.04 |
| 5 | 9 | .148 | .75 | .86 | .87 | .93 | .99 | 1.04 | 1.09 | 1.13 | 1.22 |
| 5 6 7 8 9 | 9 8 8 8 | . 165 | 1.00 | 1.12 | 1.12 | 1.26 | 1.26 | 1.36 | 1.36 | 1.47 | 1.47 |
| 7 | 8 | . 165 | 1.20 | 1.32 | 1.32 | 1.48 | 1.48 | 1.60 | 1.60 | 1.72 | 1.72 |
| 8 | 8 | .165 | 1.50 | 1.65 | 1.65 | 1.86 | 1.86 | 2.02 | 2.02 | 2.17 | 2.17 |
| | 7 | .180 | 1.70 | 1.91 | 1.91 | 2.07 | 2.07 | 2.23 | 2.23 | 2.42 | 2.42 |
| 10 | 6 5 | .203 | 2.10 | 2.30 | 2.30 | 2.49 | 2.49 | 2.70 | 2.70 | 2.95 | 2.95 |
| 11 | 5 | .220 | 2.50 | 2.74 | 2.74 | 2.98 | 2.98 | 3.26 | 3.20 | 3.43 | 3.43 |
| 12 | 41/2 | .229 | 2.90 | 3.12 | 3.12 | 3.40 | 3.40 | 3.65 | 3.65 | 4.00 | 4.00 |
| 13 | 4 ~ | .238 | 3.20 | 3.53 | 3.53 | 3.86 | 3.86 | 4.07 | 4.07 | 4.60 | 4.60 |

Tubes more than four gauges heavier than Standard will be charged per pound.



SEAMLESS COPPER BOILER TUBE FERRULES

PLAIN FERRULE







Fig. 6954A

Fig. 6954B

PLAIN COPPER BOILER TUBE FERRULES

Price per Hundred

| Diameter | Width | | | Тн | CKNESS INC | HES | | |
|----------|---|-------|-------|-------|------------|-------|-------|-------|
| Inches | Inches | 1/32 | 8/64 | 1/16 | 5/64 | 3/32 | 7/64 | 1/8 |
| 1 { | 1/2 | 5.00 | 7.00 | 9.00 | 10.50 | 12.00 | 13.00 | 14.00 |
| 1 | 1/87/87/87/87/87/87/87/87/87/87/87/87/87/ | 5.50 | 7.50 | 9.50 | 11.00 | 12.50 | 13.50 | 14.50 |
| 11/ | 1/2 | 6.00 | 8.00 | 10.00 | 11.50 | 13.00 | 14.00 | 15.00 |
| 11/4 | 5% | 6.50 | 8.50 | 10.50 | 12.00 | 13.50 | 14.50 | 15.50 |
| 11/ | 1/6 | 6.50 | 8.50 | 10.50 | 12.00 | 13.50 | 14.50 | 15.50 |
| 11/2 | 5% | 7.00 | 9.00 | 11.00 | 12.50 | 14.00 | 15.00 | 16.00 |
| 1 | 1/2 | 7.00 | 9.00 | 11.00 | 12.50 | 14.00 | 15.00 | 16.00 |
| 134 | 5% | 7.50 | 9.50 | 11.50 | 13.00 | 14.50 | 15.50 | 16.50 |
| | 3/4 | 8.00 | 10.00 | 12.00 | 13,50 | 15.00 | 16.00 | 17.00 |
| 1 | 1/2 | 7.50 | 9.50 | 11.50 | 15.00 | 16.50 | 17.50 | 18.50 |
| | 5% | 8.00 | 10.00 | 12.00 | 15.50 | 17.00 | 18.00 | 19.00 |
| 1% } | 3/4 | 8.50 | 10.50 | 12.50 | 16.00 | 17.50 | 18.50 | 19.50 |
| | 7/8 | 9.50 | 11.50 | 13.50 | 17.00 | 18.50 | 19.50 | 20.50 |
| 1 | 1 | 10.50 | 12.50 | 14.50 | 18.00 | 19.50 | 20.50 | 21.50 |
| 1 | 1/6 | 8.00 | 10.00 | 12.00 | 15.50 | 21.00 | 25.00 | 29.00 |
| 100 | 56 | 8.50 | 10.50 | 12.50 | 16.00 | 21.50 | 25.50 | 29.50 |
| 2 3 | 1/2 5/8 3/4 7/8 | 9.00 | 11.00 | 13.00 | 16.50 | 22.00 | 26.00 | 30.00 |
| | 3/2 | 10.00 | 12.00 | 14.00 | 17.50 | 23.00 | 27.00 | 31.00 |
| | 1 | 11.00 | 13.00 | 15.00 | 18.50 | 24.00 | 28.00 | 32.00 |
| } | 5/8 3/4 | 10.50 | 12,50 | 16.50 | 20.00 | 25.50 | 27.50 | 31.50 |
| 01/ | 34 | 11.00 | 13.00 | 17.00 | 20.50 | 26.00 | 28.00 | 32.00 |
| 21/4 | 7/8 | 12.00 | 14.00 | 18.00 | 21.50 | 27.00 | 29.00 | 33.00 |
| | 1 | 13.00 | 15.00 | 19.00 | 22.50 | 28.00 | 30.00 | 34.00 |
| 1 | 5/6 | 12.50 | 14.50 | 18.50 | 23.00 | 29.50 | 31.50 | 33.50 |
| 01/ | 5/8 3/4 2/8 | 13.00 | 15.00 | 19.00 | 23.50 | 30.00 | 32.50 | 34.00 |
| 21/2 | 3/6 | 14.00 | 16.00 | 20.00 | 24.50 | 31.00 | 33.00 | 35.00 |
| | 1 | 15.00 | 17.00 | 21.00 | 25.50 | 32.00 | 34.00 | 36.00 |
| 7 | 3/ | 16.00 | 18.00 | 23.00 | 29.50 | 38.00 | 44.00 | 50.00 |
| 3 | 3/4 7/8 | 17.00 | 19.00 | 24.00 | 30.50 | 39.00 | 45.00 | 51.00 |
| | 1 | 18.00 | 20.00 | 25.00 | 31.50 | 40.00 | 46.00 | 52.00 |
| - 6 | 3/4 | 19.00 | 21.00 | 25.00 | 32.50 | 42.00 | 50.00 | 60.00 |
| 31/4 | 3/4 7/8 | 20.00 | 22.00 | 26.00 | 33.50 | 43.00 | 51.00 | 61.00 |
| | 1 | 21.00 | 23.00 | 27.00 | 34.50 | 44.00 | 52.00 | 62.00 |
| 7 | 3/4 | 22,00 | 24.00 | 28.00 | 36.50 | 47.00 | 59.00 | 70.00 |
| 31/2 | 3/4 7/8 | 23.00 | 25.00 | 29.00 | 37.50 | 48.00 | 60.00 | 71.00 |
| - | 1 | 24.00 | 26.00 | 30.00 | 38.50 | 49.00 | 61.00 | 72.00 |
| 1 | 7/8 | 27.00 | 29.00 | 34.00 | 42.50 | 53.00 | 69.00 | 81.00 |
| 4 | 1 | 28.00 | 30.00 | 35.00 | 43.50 | 54.00 | 70.00 | 82.00 |
| | 11/4 | 29.00 | 31.00 | 36.00 | 44.50 | 56.00 | 71.00 | 83.00 |

^{*}Flanged Ferrules, 2.00 per hundred extra.

SHELBY COLD DRAWN SEAMLESS STEEL TUBING

ROUND

| | alent in Dec | | | Pi | HICE PER | Гоот. | OUT | SIDE I | DIAMET | ER IN | CHES | | | |
|---|-----------------|-------|-------|-------|----------|-------|------|----------------|--------|----------------|------|-------|----------------|------|
| tions | imal o | 1/2 | 5/8 | 34 7 | 8 1 | 11/8 | 11/4 | $1\frac{3}{8}$ | 11/2 | $1\frac{3}{4}$ | 2 - | 21/4 | $2\frac{1}{2}$ | 23/4 |
| 20 | .035 | .09 | .11 . | 14 .1 | | .21 | .23 | .25 | .28 | | | | | |
| 18 | .049 | .12 | | 19 .2 | | .28 | .32 | .35 | .38 | | | | | |
| 16 | .065 | .15 | .20 . | 24 .2 | 8 .33 | .37 | .41 | .46 | .50 | .58 | .67 | .76 | .85 | .93 |
| 14 | .083 | .19 | .24 . | 30 .3 | 5 .42 | .46 | .52 | .57 | .63 | .74 | .85 | .96 | 1.07 | 1.18 |
| 13 | .095 | .22 | .27 . | 33 .4 | 0 .46 | .52 | .59 | . 65 | .71 | .84 | .97 | 1.10 | 1.22 | 1.3 |
| 12 | .109 | .23 | .30 . | 38 .4 | 5 .52 | .59 | .67 | .74 | .81 | .96 | 1.10 | 1.25 | 1.39 | 1.5 |
| 11 | .120 | .25 | .33 | 41 .4 | | .65 | .73 | .81 | .89 | 1.05 | 1.21 | 1.37 | 1.53 | 1.6 |
| 10 | .134 | | .35 | 44 .5 | | .71 | .80 | .89 | .98 | 1.16 | 1.34 | 1.52 | 1.70 | 1.8 |
| | .156 | | | 50 .6 | | .81 | .91 | 1.02 | 1.12 | 1.33 | 1.54 | 1.75 | 1.96 | 2.16 |
| 3/2 | .188 | | | 57 .6 | | .94 | 1.07 | 1.19 | | 1.57 | 1.82 | | 2.32 | |
| 7 | .219 | | | 7 | | 1.06 | 1.21 | 1.35 | | 1.79 | 2.08 | | 2.66 | 2.9 |
| 1/ | .250 | | | | 1 00 | 1.17 | 1.34 | 1.50 | | 2.00 | 2.34 | | 3.00 | 3.3 |
| 52 | .313 | | | | | 1.1. | 1.57 | 1.77 | 1.98 | 2.40 | 2.82 | | 3.65 | 4.0 |
| 36 | .375 | | | | | | 1.75 | 2.00 | | 2.75 | | | 4.25 | 4.7 |
| 1/8 | .500 | | | | | | 1.10 | 100 | 2.67 | 3.34 | | | 5.34 | |
| 5 32 316 7 82 1/4 5/6 3/8 1/2 5/8 | .625 | | | | | | | | | | | 5.42 | | |
| 78 | .020 | | | D. | ICE PER | Foom. | 0 | in T | DIAMET | nn Tw | | 0.42 | 0.20 | 1.00 |
| 3. W. G | Dec. | | | 1 | | | - | - | | | | | | |
| | | 3 | 31/4 | 31/2 | 33/4 | 4 | 4 | 1/4 | 41/2 | 4 | 3/4 | 5 | | 51/2 |
| 13 | . 095 | 1.48 | 1.60 | 1.73 | | | | | | | | | | |
| 12 | .109 | 1.69 | 1.83 | 1.97 | | | | | | | | | | |
| 11 | .120 | 1.85 | 2.01 | 2.17 | 2.33 | 2.49 | | | | | | | | |
| 10 | .134 | 2.05 | 2.23 | 2.41 | 2.59 | 2.77 | 2. | 95 | 3.13 | 3 | .31 | 3.48 | 3 3 | 3.84 |
| 5 22 | .156 | 2.37 | 2.58 | 2.79 | 3.00 | 3.21 | 3. | 41 | 3.62 | 3 | .83 | 4.04 | 4 | 1.46 |
| 3/6 | .188 | 2.82 | 3.07 | 3.32 | 3.57 | 3.82 | 4. | 07 | 4.32 | 4 | 57 | 4.82 | 2 5 | 32 |
| 7 | .219 | 3.25 | 3.54 | 3.83 | 4.12 | 4.41 | 4. | 71 | 5.00 | | 29 | 5.58 | 3 6 | 5.16 |
| 1/ | .250 | 3.67 | 4.00 | 4.34 | 4.67 | 5.00 | | | 5.67 | | .00 | 6.34 | | 7.00 |
| 5% | .313 | 4.48 | 4.90 | 5.32 | 5.73 | 6.15 | | | 6.98 | | 40 | 7.82 | | 3.65 |
| 3/2 | .375 | 5.25 | 5.75 | 6.25 | 6.75 | 7.25 | | | 8.25 | | 76 | 9.26 | | 0.26 |
| 5 3 ² 3/6 7 3 ² 1/4 5/6 3/8 1/2 | .500 | 6.67 | 7.34 | 8.00 | 8.67 | 9.34 | | | 10.67 | | 34 | 12.00 | | 3.34 |
| 5/2 | .625 | 7.92 | 8.75 | 9.59 | 10.42 | 11.25 | | | 12.92 | | 76 | 14.59 | | 5.26 |
| 5/8 3/4 7/8 | .750 | 9.00 | 10.00 | 11.00 | 12.01 | 13.00 | | | 15.01 | 16 | | 17.01 | | 0.01 |
| 74 | .875 | 9.92 | 11.09 | 12.26 | 13.42 | 14.59 | | | 16.92 | 18 | | 19.26 | | 1.59 |
| 18 | | 10.67 | 12.09 | 13.34 | 14.67 | 16.01 | | | 18.67 | 20 | | 21.34 | | 1.01 |
| 1 | 1.000 | 10.07 | 14.01 | 10.04 | 14.01 | 10.01 | 116. | 04 | 19.01 | 20 | UL | 21.09 | 24 | t.UL |

SQUARE AND RECTANGULAR

| | | | PRICE PER FOOT. OUTSIDE DIAMETER INCHES | | | | | | | | | | | | | |
|-------------------------|-------|-----------|---|-------------|------|------|-------------|------|------|------|------|------|------|------|------|--|
| B.W.G. | Dec. | 1/2 5/8 | 34 | ₹ ⁄8 | 1 | 11/8 | 1^{1}_{4} | 13 8 | 11/2 | 13/4 | 2 | 214 | 21/2 | 23/4 | 3 | |
| 20 | .035 | .11 .14 | .17 | .20 | .23 | .26 | | | | | | | | | | |
| 18 | .049 | .15 .19 | 24 | .28 | . 32 | .36 | | | | 1 | | 1 | | | | |
| 16 | .065 | [19].25 | .30 | .36 | .42 | .47 | .53 | .58 | . 64 | . 75 | .86 | 1 | | | | |
| 14 | .083 | | .38 | . 45 | .52 | . 59 | .66 | . 73 | .80 | | 1.08 | 1 | | | | |
| 13 | .095 | ¦ | | . 51 | .59 | .67 | . 75 | . 83 | .91 | 1.07 | 1.23 | | | | | |
| 12 | . 109 | ! | | | . 66 | . 75 | .85 | .94 | 1.03 | 1.22 | 1.40 | | | | | |
| 11 | .120 | | | | . 72 | .82 | .92 | 1.03 | 1.13 | 1.33 | 1.53 | 1.74 | 1.94 | 2.15 | 2.35 | |
| 10 | . 134 | | | | ' | | | | | 1.47 | | | 2.16 | | | |
| 3 ¹ 2 316 | . 156 | | | | | | | | | | 1.96 | | | | | |
| 316 | .188 | | ١ | | | | | | ١ | 1.99 | 2.31 | 2.63 | 2.95 | 3.27 | 3.58 | |

AMERICAN SPIRAL RIVETED PIPE

PLAIN ENDS

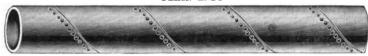


Fig. 3963A

When asking for estimates on Piping, specify quantities in feet or equivalent, diameter in inches or equivalent, purpose for which piping will be used and material to be conveyed.

Specify maximum working pressure under which piping will operate, and whether pump or gravity. On long lines where the head varies greatly, send profile or elevation, as several weights of piping may be used to advantage.

| No. 20 U | | | | | | | 10.1 | вU. | s. G | AUG | E | | | |
|--|---|----------------|--|--|--|--|-----------------------------|--|--|-------------------------------|---|--|--|--|
| Size | inc | hes | 3 | 4 | 5 | 3 | 4 | 5 | 6 | 7 | 8 | | | |
| Price, Asphalt Coated | , pou | . | .354 .474 1.9 1500 | 2.4 | .554 .744 2.9 900 | 2.3 | .505 .680 3.0 1500 | .613 .826 3.7 1200 | | .846 1.146 5.1 860 | .967 1.307 5.8 750 | | | |
| | No. | 16 (| U.S. | GAL | JGE | | | | | | | | | |
| Sizeinches | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | |
| " Galvanized " | .520 .728 3.7 1875 | 4.5 | | $\substack{\textbf{1.216} \\ \textbf{6.2}}$ | 1,395 7.1 | | | 1.897 9.7 | $2.067 \\ 10.6$ | 1.60 2.25 11.4 575 | $\begin{array}{c} 2.52 \\ 12.9 \end{array}$ | | | |
| No. 14 U. S. GAUGE Sizeinches 6 7 8 9 10 12 14 15 16 18 20 | | | | | | | | | | | | | | |
| Sizeinches | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 | 18 | 20 | | | |
| " Galvanized " 1 Approx. Wt. per ft., Asphaltedlbs. | .207 6.6 | 1.410 7.7 | 1.620 8.8 | 1.812 9.9 | 2.013 11.0 | 2.395 13.0 | $\frac{2.91}{15.9}$ | $\frac{3.12}{17.0}$ | $3.33 \\ 18.1$ | | 4.06 | | | |
| Bursting Strength per sq. in " 1560 1340 1170 1045 935 780 670 625 585 520 470 NO. 12 U. S. GAUGE | | | | | | | | | | | | | | |
| Sizeinches | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 | 18 | 20 | | | |
| Apprex. Wt. per ft., Asphalted lbs. | $egin{array}{c} .614_{\scriptscriptstyle \parallel} \ 9 .2_{\scriptscriptstyle \parallel} \end{array}$ | 1.880 10.7 | $ 2.166 \\ 12.3$ | $\begin{array}{ c c } 2.447 \\ 13.9 \end{array}$ | $\begin{array}{ c c } 2.688 \\ 15.3 \end{array}$ | $ 3.188 \\ 18.2$ | 3.89 | $\begin{vmatrix} 4.16 \\ 23.7 \end{vmatrix}$ | 4.43 | 4.84 | 3.82 5.37 30.6 660 | | | |
| No | o. 10 | U. | s . G | AUG | Ε | | N | 0.8 | U.S | . GA | UGE | | | |
| Sizeincl | hes | 12 | 13 | 14 | 15 | 16 | 18 | 20 | 16 | 18 | 20 | | | |
| Price, Asphalt Coated per for Galvanized | bs. | $3.881 \ 22.5$ | $\begin{bmatrix} 4.22 \\ 24.5 \end{bmatrix}$ | $ \frac{4.75}{27.6} $ | $\begin{bmatrix} 5.10 \\ 29.6 \end{bmatrix}$ | $\begin{bmatrix} 5.42 \\ 31.5 \end{bmatrix}$ | 5.95 34.5 | $\frac{6.59}{38.3}$ | $\begin{vmatrix} 6.54 \\ 38.1 \end{vmatrix}$ | 7.16 | $7.94 \\ 46.2$ | | | |
| N | 10. 6 | S U. | S. G | AUG | E | | N | о. З | U.S | . GA | UGE | | | |
| Sizeincl | Sizeinches 16 18 20 22 24 16 18 20 22 24 | | | | | | | | | | | | | |
| Price, Asphalt Coatedper f. "Galvanized" Approx. Wt. per ft., Asphalted, l Bursting Strength per sq. in | lbs. | $7.67 \\ 44.7$ | 49.0 | $9.28 \\ 54.1$ | $10.21 \\ 59.5$ | 11.09 64.6 | $8.84 \\ 51.6$ | $\begin{array}{c} 10.14 \\ 59.2 \end{array}$ | $\begin{array}{c} 11.23 \\ 65.6 \end{array}$ | 8.83 12.36 72.2 1364 | 13.43 78.4 | | | |

FLANGES FOR AMERICAN SPIRAL RIVETED PIPE

FORGED STEEL SPIRAL PIPE STANDARD DIAMETER AND DRILLING

| | | Thick- | Prici | e, Each, w | ти Вогт Н | loles | DIMENSI | ons of D | RILLING |
|--------|--------------------|--|---------------------------|-------------------------------|---------------------------|-------------------------------|-----------------------|--|--------------------------------|
| Size | Outside | ness | Bu | ACK | GALVA | NIZED | | Size | Diam. |
| Inches | Diameter Inches | of Flange Inches | Flange Not Attached | Flange Attached to Pipe | Flange Not Attached | Flange Attached to Pipe | Number of Bolts | of Bolts Inches | of Bolt Circle Inches |
| 3 | 6 | 5/16 | .90 | 1.75 | 1.10 | 1.90 | 4 | į, | 434 |
| 4 | 7 | 516 | 1.05 | 2.05 | 1.30 | 2.30 | 8 | -Te-, te-Te-\2\2\2\2\2\2\2\2\2\2\2\2\2\2\2\2\2\2\2 | 5 1 2 |
| 5 | 8 | 510 | 1.35 | 2.40 | 1.60 | 2.70 | 8 | 17 | 618 |
| 6 | 9 | 5\6\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8\ | 1.60 | 2.75 | 2.00 | 3.15 | 8 8 8 | 1/2 | 77.8 |
| 7 | 10 | 3/8 | 1.70 | 2.95 | 2.15 | 3.40 | 8 | $1\frac{7}{2}$ | 9 ° |
| 8 | 11 | 3,8 | 2.15 | 3.45 | 2.80 | 4.05 | 8 | 1/2 | 10 |
| 9 | 13 | 3/8 | 2.65 | 4.10 | 3.50 | 4.90 | 8 | $1\frac{7}{2}$ | 111/4 |
| 10 | 14 | 3/8 | 2.95 | 4.50 | 3.95 | 5.45 | 8 | 12 | 1214 |
| 11 | 15 | 16 | 3.10 | 4.65 | 4.15 | 5.65 | 12 | $\frac{1}{2}$ | 133 4 |
| 12 | 16 | 1 <mark>7</mark> | 3.25 | 4.75 | 4.35 | 5.85 | 12 | $\frac{1}{2}$ | 141/ |
| 13 | 17 | 16 7 16 9 | 3.60 | 5.15 | 4.85 | 6.25 | 12 | $\frac{1}{2}$ | 151/ |
| 14 | 18 | 7 16 | 3.80 | 5.50 | 5.10 | 6.80 | 12 | 1/2 | 1614 |
| 15 | 19 | 16 | 4.75 | 7.75 | 6.35 | 9.35 | 12 | $\frac{1}{2}$ | $17\frac{7}{18}$ |
| 16 | 2114 | 5,8 5,8 5,8 5,8 | 6.50 | 8.60 | 9.00 | 11.00 | 12 | $\frac{1}{2}$ | 191/ |
| 18 | 23^{14} | 5/8 | 7.90 | 10.30 | 11.00 | 13.35 | 16 | 5/8 | 2114 |
| 20 | 25^{1} | 5/8 | 9.30 | 12.50 | 12.75 | 15.85 | 16 | 5/8 | 231/8 |
| 22 | $28\frac{1}{4}$ | 116 116 | 11.60 | 15.95 | 15.90 | 20.25 | 16 | $\frac{5}{8}$ | 26 |
| 24 | 30 | 118 | 13.00 | 18.00 | 17.70 | 22.70 | 16 | 5/8 | 2734 |
| 26 | 32 | ي بد | 13.50 | 18.25 | 18.95 | 23.70 | 24 | 3/4 | 2934 |
| 28 | 34 | - G 55 - G | 14.25 | 19.50 | 20.15 | 25.40 | 28 | 34 | 3137 |
| 30 | 36 | Dependent on service required | 15.25 | 21.25 | 21.60 | 27.60 | 28 | 3, | 3337 |
| 32 | 38 | 7 Se | 16.00 | 22.75 | 22.75 | 29.50 | 28 | 34 | 3534 |
| 34 | 40 | Der | 17.00 | 24.50 | 24.25 | 31.75 | 28 | 3/4 | 3734 |
| 36 | 42 | D 0 7 | 18.50 | 26.00 | 26.10 | 33.60 | 32 | 34 | 3934 |
| 40 | 46 | | 20.00 | 28.75 | 28.50 | 37.25 | 32 | 34 | 4334 |

FORGED STEEL A. S. M. E. STANDARD DIAMETER AND DRILLING

| * 3 | 71/2 | | 1.60 | 2.60 | 2.45 | 3.40 | 4 | 5/8 | 6 |
|-----|---------------------|---------------------------|-------|-------|-------|--------------|----|----------------------------|------------------|
| 4 | 9 | 16 | 2.00 | 3.60 | 2.80 | 4.40 | 4 | 3/4 | 716 |
| 5 | 10 | 1 % | 2.15 | 4.30 | 3.10 | 5.20 | 8 | 3,7 | 81.3 |
| 6 | 11 | 19 | 2.85 | 4.80 | 3.90 | 5.85 | 8 | 3,7 | 91 2 |
| 7 | 121/2 | 16 9 16 | 3.35 | 5.70 | 5.00 | 6.95 | 8 | 3/4 | 1034 |
| 8 | $13\frac{1}{2}$ | 5 3 | 4.15 | 6.35 | 5.80 | 8.00 | 8 | 37 | 1134 |
| 9 | 15 | 5 8 5 8 | 4.85 | 7.20 | 7.00 | 9.20 | 12 | 37 | 1314 |
| 10 | 16 | 11 | 5.85 | 7.90 | 8.00 | 10.00 | 12 | 3/4/4/3/4/3/4/8 3/4/4/8 | 1417 |
| 12 | 19 | 18 | 9.25 | 11.30 | 12.75 | 14.80 | 12 | 7/8 | 17 |
| 14 | 21 | 3 4 | 10.45 | 12.90 | 14.50 | 16.75 | 12 | 1 | 1834 |
| 15 | 2214 | $\frac{37}{4}$ | 12.00 | 16.90 | 16.80 | 21.70 | 16 | 1 | 20 |
| 16 | 2313 | $\frac{3\overline{4}}{4}$ | 12.30 | 17.20 | 17.10 | 22.00 | 16 | Ī | 2114 |
| 18 | 25 | 34 | 15.75 | 19.75 | 23.25 | 27.25 | 16 | 118 | 2237 |
| 20 | 2716 | 34 34 74 78 | 18.50 | 23.50 | 2સ.00 | 33,00 | 20 | 11% | 25 |
| 22 | $291\frac{7}{2}$ | 34 | 21.75 | 26.75 | 32.50 | 37.50 | 20 | 114 | 2714 |
| 24 | 32 ~ | 73 | 23.50 | 30.25 | 36.00 | 42.90 | 20 | 114 | $291\frac{7}{2}$ |
| *26 | 3414 | 138 | 28.50 | 56.90 | 43.90 | 52.25 | 24 | 114 | $31\frac{37}{4}$ |
| *28 | 3613 | 13 8 | 31.50 | 41.00 | 48.75 | 58.00 | 28 | 114 | 34 |
| *30 | $38^{3}\frac{7}{4}$ | 138 | 34.75 | 45.00 | 53.25 | 63.50 | 28 | 13% | 36 |
| *36 | $453\frac{7}{4}$ | $\frac{1}{2}$ | 52.00 | 68.00 | 80,00 | 96.25 | 32 | 138 | 4237 |
| *40 | 50 | $1^{1}\frac{5}{2}$ | 62.50 | 82.50 | 97.00 | 116.50 | 36 | 112 | 4714 |
| *40 | 50 | 112 | 62.50 | 82.50 | 97.00 | 116.50_{-} | 36 | 112 | |

*These sizes only are made in cast iron at time catalogue goes to press. We can furnish threaded companion flanges to match the above standard.



CAST IRON FLANGED FITTINGS

FOR SPIRAL RIVETED FLANGED PIPE RIBOW TEE

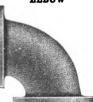






Fig. 5597B



Fig. 5597C

| | | | BLACE | <u>'</u> | | |
|--------|------------|------------|--------|---------------|---------|------------|
| Size | | | Pric | Е, ЕАСН | | |
| Inches | 90° Elbows | 45° Elbows | Tees | Reducing Tees | Crosses | Y Branches |
| 3 | 2.25 | 1.95 | 3.60 | 4.00 | 4.80 | |
| 4 | 3.30 | 3.00 | 5.30 | 5.80 | 8.00 | 8.00 |
| 5 | 4.60 | 4.00 | 6.60 | 7.30 | 9.90 | 10.30 |
| 6 | 4.80 | 4.20 | 7.00 | 7.70 | 10.20 | 12.50 |
| 7 | 6.10 | 4.50 | 8.50 | 9.40 | 14.00 | 14.00 |
| 8 | 9.30 | 7.00 | 13.50 | 14.80 | 24.00 | 20.00 |
| 9 | 12.90 | 10.50 | 17.00 | 18.70 | 30.00 | 29.00 |
| 10 | 14.60 | 11.00 | 20.00 | 22.00 | 38.00 | 38.00 |
| 11 | 17.90 | 15.00 | 26.00 | 28.00 | 46.00 | 46.00 |
| 12 | 20.20 | 17.00 | 31.00 | 34.00 | 55.00 | 54.00 |
| 14 | 30.90 | 18.00 | 46.00 | 50.00 | 64.00 | 74.00 |
| 15 | 39.50 | 22.00 | 56.00 | 62.00 | 80.00 | 86.00 |
| 16 | 56.60 | 36.00 | 84.00 | 93.00 | 102.00 | 125.00 |
| 18 | 67.40 | 52.00 | 110.00 | 121.00 | 129.00 | 142.00 |
| 20 | 89.20 | 62.00 | 116.00 | 128.00 | 146.00 | 154.00 |
| 2-2 | 105.00 | 74.00 | 153.00 | 168.00 | 193.00 | 197.00 |
| 24 | 132.00 | 91.00 | 187.00 | 206.00 | 240.00 | 249.00 |

GALVANIZED

| Size | 1 | | PRICE | , Елсн | | |
|--------|------------|------------|---------------|---------------|---------|------------|
| Inches | 90° Elbows | 45° Elbows | Tees | Reducing Tees | Crosses | Y Branches |
| 3 | 2.80 | 2.35 | 4.40 | 4.75 | . 5.85 | |
| 4 | 4.00 | 3.70 | 6.40 | 7.00 | 9.70 | 9.90 |
| 5 | 5.50 | 4.90 | 8.00 | 8.80 | 12.00 | 12.60 |
| 6 | 6.40 | 5.50 | 9.20 | 9.80 | 13.50 | 16.50 |
| 7 | 8.00 | 6.00 | 11.20 | 12.00 | 19.00 | 18.70 |
| 8 | 12.30 | 9.50 | 18.00 | 19.00 | 31.00 | 27.00 |
| 9 | 17.00 | 14.00 | 22.50 | 24.00 | 40.00 | 37.50 |
| 10 | 19.20 | 15.00 | 26 .00 | 28.00 | 50.00 | 50.00 |
| 11 | 22,40 | 19.50 | 34.00 | 37.00 | 61.00 | 61.00 |
| 12 | 26.60 | 22.00 | 41.00 | 44.00 | 72.00 | 71.00 |
| 14 | 41.70 | 24.00 | 61.00 | 66.00 | 86.00 | 100.00 |
| 15 | 53.00 | 30.00 | 76.00 | 82.00 | 108.00 | 116.00 |
| 16 | 76.00 | 49.00 | 113.50 | 122.00 | 138.00 | 168.00 |
| 18 | 91.00 | 70.00 | 148.00 | 159.00 | 174.00 | 191.00 |
| 20 | 120.00 | 84.00 | 157.00 | 168.00 | 197.00 | 208.00 |
| 22 | 142.00 | 100.00 | 206.00 | 222.00 | 260.00 | 266.00 |
| 24 | 178.00 | 122.00 | 253.00 | 272.00 | 325.00 | 336.00 |

The above list is for fittings drilled in accordance with spiral pipe standard. Fittings can be furnished flanged and drilled A. S. M. E. standard at a slight additional cost. Base elbows for supporting vertical runs, furnished when ordered.

FORGED STEEL FLANGES, JOINTS, ETC.

FOR SPIRAL RIVETED PIPE

PLANGE JOINT



Fig. 2126A

The introduction and use of our new forged steel flanges has enabled us to furnish pipe with connections superior to anything else on the market.

Being strictly forged steel permits them to be attached securely and rigidly to the pipe by use of power riveters, making an absolutely tight joint, and eliminating the possibility of a leak.

They are forged from the best grade of steel, and cannot be cracked or broken in transit or installation.

This point is fully appreciated by those who have attempted to replace broken cast iron flanges after the pipe has been connected up.

EXPANSION JOINT



Fig. 2126B

expansion and contraction. To take care of this it is customary to use our expansion joints (cast bodies and brass sleeve) or bolted joints, at intervals of about 400 feet.

Owing to differences in temperature on long lines, flanged pipe undergoes a large amount of

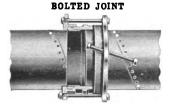


Fig. 2126C

Undoubtedly the most perfect joint ever devised for hydraulic purposes. Unbreakable in handling, transportation or use. Absolutely tight under pressure. Allows slight deflection without leakage, conforming to grade line, and the cheapest joint in the long run. One of our latest improvements, which is especially appreciated by the men who "lay the line." The bolted joint takes care of all expansion and contraction, and is suitable for the highest pressure. By

using pipe in shorter lengths, long radius bends are often made with bolted joints, instead of using special fittings.

The slip joint is used largely for medium and low pressure work. The sleeve, which is attached to one end of the pipe, is wrapped with burlap or canvas soaked in red lead or liquid asphaltum, then driven into the adjoining pipe. Lugs are then connected by wire, in order to hold pipe securely.

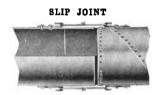


Fig. 2126D



FORGED STEEL BOILER FLANGES

STANDARD







Fig. 2125B

Our new Forged Steel Boiler Flanges are superior to anything yet produced, and embody many features. The hub, the essential part of a flange, is extra heavy, and on the outside it joins the main body of the flange with a large curve or fillet, while the inside or threaded part comes to a sharp, square corner with the face, thus allowing the pipe to be screwed close to the face and receive additional strength from the main body of the flange. The outside of the flange is finished with the proper bevel for calking, and the face is exceptionally smooth, so perfect contact is assured when attached. Our deep hub enables us to have a long, perfect thread. All threaded flanges are tested with Briggs' Standard Pipe Thread Gauges, as adopted by wrought pipe manufacturers.

Flanges are furnished plain or threaded, also flat, or bent to the desired circle.

STANDARD

| Non-Inal | Outside | Thickness | Depth of | Diameter of | PRICE, EA | CH FLAT | Price for Bending |
|----------------|--------------------|-----------|--------------------------|-----------------|-----------|---------|----------------------|
| Size Inches | Diameter Inches | Inches | | Hub, Inches | Threaded | Plain | Add to Flat Lists |
| 34 | Ü | 15 | 1 | 1/8 | 1.50 | 1.40 | .20 |
| 1 | 6 | 1 35 | 1 | $2\frac{1}{18}$ | 1.60 | 1.40 | .20 |
| 114 | 6^{1}_{2} | 5 | ' 1 | 21/3 | 1.75 | 1.55 | .20 |
| 115 | 7 | 3% | 11/4 | 213 | 2.00 | 1.80 | .25 |
| 2 | 8 | 3,3 | 11/4 | 3.5 | 2.40 | 2.10 | .25 |
| 2!.5 | 81 2 | 3% | 11.3 | 37% | 2.60 | 2.30 | .30 |
| 3 - | 9 - | 3,3 | 113 | 458 | 2.80 | 2.65 | .30 |
| 31.5 | 91,2 | 1 7 | 11/3 | 5 ° | 3.60 | 3.05 | .35 |
| 4 2 | 10 2 | 176 17 | 11.5 | 516 | 4.00 | 3.35 | .35 |
| 41/2 | 101.6 | 1% | 11/3 | 6 | 4,75 | 4.00 | .40 |
| 5 - | 111.5 | 1/2 | 2 2 | 611 | 6.50 | 4.75 | .40 |
| 6 | 121.5 | 1/3 | 2 | 73% | 7.50 | 6.00 | .45 |
| 7 | 14 | 5.3 | 21/ | 87% | 10.60 | 8.60 | .55 |
| 8 | 15 | 5% | 21/4 | 978 | 14.00 | 11.40 | .70 |
| 9 | 16 | 3,3 | 213 | 11′° | 19.40 | 16.00 | .85 |
| 10 | 1713 | 3/4 | $\frac{\overline{2}}{2}$ | 12_{16}^{3} | 21.00 | 17.00 | 1.00 |
| 12 | 20 | 13 | 3 2 | 145% | 32.75 | 28.00 | 1.25 |

EXTRA HEAVY FOR DOUBLE RIVETING

| 1 | 71/2 | 3/8 | 1,16 | 2 | 1.60 | 1.40 | .20 |
|------|-------|-----|----------------|----------------|------|------|-----|
| 11/4 | 81/2 | 3/8 | 11/2 | $2\frac{1}{2}$ | 1.75 | 1.55 | .20 |
| 11/2 | 9 | 1/2 | $1^{1}\bar{2}$ | 218 | 2.00 | 1.80 | .25 |
| 2 | 91/2 | 1/2 | 11/2 | 3,5 | 2.40 | 2.10 | .25 |
| 214 | 10 | 1/2 | 15% | 378 | 2.60 | 2.30 | .30 |
| 3 - | 101/2 | 1/2 | 15% | 45 8 | 2.80 | 2.65 | .30 |
| 31/4 | 11 | 16 | 15% | 5 | 3.60 | 3.05 | .35 |
| 4 | 111/2 | 18 | 15 8 | 5.8 | 4.00 | 3.35 | .35 |
| 434 | 121/4 | 5/8 | 15% | 6 | 4.75 | 4.00 | .40 |
| 5 | 13 | 5/8 | 21% | 611 | 6.50 | 4.75 | .40 |
| 6 | 14 | 5/8 | 21/8 | 734 | 7.50 | 6.00 | .45 |

Above prices subject to discount.

Prices for bent flanges apply only to the following circles: 18, 24, 30, 36, 42, 48, 54, 60, 66 and 72 inches. Special prices will be quoted for other circles.

An extra charge is made for bending flanges 7 inches and smaller to a circle under 18 inches, and for 8 inches and larger to circles under 24 inches.

Flanges are threaded with the standard taper thread.

SPECIAL FLANGED FITTINGS

FOR PHOSPHATE MINING

REDUCING DOUBLE BRANCH FLANGED ELBOW

RETURN BEND WITH BACK OUTLET

PENE FLANGE FOR PLAIN END CASING



Fig. 3789A



Fig. 3789B SPECIAL ANGLE ELBOWS



Fig. 3789C

ELBOW WITH CLEANOUT FLANGE



5%° 11¼° 22¼° 30° 60°



Fig. 3789E



Fig. 3789F

Pig. 3789D

OFFSET



DOUBLE LATERAL



Fig. 3789G



Fig. 3789H



Pig. 3789J

CAST IRON PIPE



STANDARD THICKNESS AND WEIGHTS OF CAST IRON PIPE, BELL AND SPIGOT PIPE. TURNED AND BORED PIPE.

All lengths to lay 12 feet. All weights are approximate; those per foot include allowance for Bell. All pipe is tested by water pressure. Turned and bored pipe made to order only.

| Nominal Inside Diameter | 100 F | ASS A GAS oot Head ids Pressure | 200 F | ASS B NDARD Oot Head ids Pressure | 300 F | ASS C M HEAVY Coot Head nds Pressure | | |
|-------------------------------|--------------------------|--|--------------------------|--|--------------------------|---|--------------------------|------------------------------|
| Inches | Thick- ness Inches | Weight Per Foot Pounds | Thick- ness Inches | Weight Per Foot Pounds | Thick- ness Inches | Weight Per Foot Pounds | Thick- ness Inches | Weight Per Foot Pounds |
| 3 | .39 | 14.5 | .42 | 16.2 | .45 | 17.1 | .48 | 18.0 |
| 4 | .42 | 20.0 | .45 | 21.7 | .48 | 23.3 | .52 | 25.0 |
| 6 | .44 | 30.8 | .48 | 33.3 | .51 | 35.8 | .55 | 38.3 |
| 8 | .46 | 42.9 | .51 | 47.5 | .56 | 52.1 | .60 | 55.8 |
| 10 | .50 | 57.1 | .57 | 63.8 | .62 | 70.8 | .88 | 76.7 |
| 12 | .54 | 72.5 | .62 | 82.1 | .68 | 91.7 | .75 | 100.0 |
| 14 | .57 | 89.6 | .66 | 102.5 | .74 | 116.7 | .82 | 129.2 |
| 16 | .60 | 108.3 | .70 | 125.0 | .80 | 143.8 | .89 | 158.3 |
| 18 | .64 | 129.2 | .75 | 150.0 | .87 | 175.0 | .96 | 191.7 |
| 20 | .67 | 150.0 | .80 | 175.0 | .92 | 208.3 | 1.03 | 229.2 |
| 24 | .76 | 204.2 | .89 | 233.3 | 1.04 | 279.2 | 1.16 | 306.7 |
| 30 | .88 | 291.7 | 1.03 | 333,3 | 1.20 | 400.0 | 1.37 | 450.0 |
| 36 | .99 | 391.7 | 1.15 | 454.2 | 1.36 | 545.8 | 1.58 | 625.0 |
| 42 | 1.10 | 512.5 | 1.28 | 591.7 | 1.54 | 716.7 | 1.78 | 825.0 |
| 48 | 1.26 | 666.7 | 1.42 | 750.0 | 1.71 | 908.3 | 1.96 | 1050.0 |
| 54 | 1.35 | 800.0 | 1.55 | 933.3 | 1.90 | 1141.7 | 2.23 | 1341.7 |
| 60 | 1.39 | 916.7 | 1.67 | 1104.2 | 2.00 | 1341.7 | 2.38 | 1583.3 |
| 72 | 1.62 | 1283.4 | 1.95 | 1545.8 | 2.39 | 1904.2 | | |
| 84 | 1.72 | 1633.4 | 2.22 | -2104.2 | | | | |



Planged Cast Iron Pipe, sizes 3 to 48 inches, same weights as Standard Pipe. Thickness of flange equals approximately $1\frac{1}{2}$ times thickness of pipe, plus $\frac{1}{2}$ inch. Pipe made in 12 foot lengths and faced $\frac{1}{4}$ -inch short for gaskets.

APPROXIMATE WEIGHTS OF LEAD AND HEMP REQUIRED FOR JOINTS

| Pipeinches | | | | | | | | 16 | 18 | 20 |
|-------------------------------------|------------|-----------------|---|---|--------------|--------------|-----------------------------|--|-----------|-------------------|
| Lead, 2 inches thickpounds Hemp | 6 .18 | 7.5 $.21$ | 10.25 .31 | $\begin{array}{c} 13.25 \\ .44 \end{array}$ | 16 .53 | .61 | .81 | | 33.8 1 | $\frac{37}{1.25}$ |
| Pipeinches | | | | | | | | | | |
| Lead, 2 inches thickpounds Hemp" | 44 1.50 | $54.25 \\ 2.06$ | $\begin{vmatrix} \overline{64.75} \\ 3 \end{vmatrix}$ | 75.25 3.62 | 85.5 4.37 | 97.6 6.25 | $\overline{108.30} \\ 8.25$ | $\begin{array}{c} 128 \\ 12.5 \end{array}$ | 147 15 | |

Inquiries and orders should clearly indicate the approximate number of lengths or feet of pipe of each size and class required. Give the desired delivery point and time of shipment, with any particulars as to sizes required first, the service intended, etc.; this will facilitate prompt attention and avoid delays.

SPECIALS FOR CAST IRON PIPE

QUARTER BEND

EIGHTH BEND

REND

TEE

CROSS











Fig. 14A

Fig. 14B

Fig. 14C

rig. 14D

Fig. 14

QUARTER BENDS, 90°

| Size inches | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
|--------------|----|----|----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| Weightpounds | 50 | 60 | 95 | 155 | 215 | 290 | 355 | 495 | 575 | 745 | 1040 | 1580 | 2230 |

EIGHTH BENDS, 45°

| Size inches | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
|--------------|----|----|----|-----|-------------|-----|-----|-----|-----|-----|-----|------|------|
| Weightpounds | 40 | 50 | 70 | 115 | 16 0 | 210 | 260 | 355 | 405 | 515 | 715 | 1060 | 1490 |

SIXTEENTH BENDS, 22%°

| Sizeinches | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
|--------------|----|----|----|-----|-------------|-----|-----|-----|-----|-----|-----|-----|------|
| Weightpounds | 35 | 45 | 60 | 100 | 13 0 | 170 | 210 | 280 | 320 | 410 | 555 | 800 | 1120 |

TEES

| Size Inches | Weight Pounds | | Weight Pounds | | Weight Pounds | Size Inches | Weight Pounds |
|--|--------------------------------------|---|--|---|--|--|-------------------------------------|
| 3x3x3 4x4x4 6x6x6 6x6x4 8x8x8 8x8x6 | 65 90 130 110 230 195 | 8x 8x 4 10x10x10 10x10x 8 10x10x 6 10x10x 4 12x12x12 | 175 300 275 240 220 395 | 12 x 12 x 10 12 x 12 x 8 12 x 12 x 6 12 x 12 x 4 14 x 14 x 14 16 x 16 x 16 | 375 345 300 270 525 735 | 16 x 16 x 12 20 x 20 x 20 24 x 24 x 24 30 x 30 x 30 36 x 36 x 36 48 x 48 x 48 | 605 1100 1565 2415 3490 |

CROSSES

| Size Inches | Weight Pounds | | Weight Pounds | | Weight Pounds | | Weight Pounds | |
|---|------------------|---|------------------|---|------------------|--|------------------|--|
| 3 x 3 x 3 x 3 4 x 4 x 4 x 4 6 x 6 x 6 x 6 | 165 | 8x 8x 4x 4 10x10x10x10 10x10x 8x 8 | 380 340 | 12 x 12 x 10 x 10 12 x 12 x 8 x 8 12 x 12 x 6 x 6 | 405 335 | 18x 18 x 18 x 18 20x 20 x 20 x 20 24x 24 x 24 x 24 | 1335 1800 | |
| 6x6x4x4 8x8x8x8 8x8x6x6 | | 10 x 10 x 6 x 6 10 x 10 x 4 x 4 12 x 12 x 12 x 12 | 250 | 12 x 12 x 4 x 4 14 x 14 x 14 x 14 16 x 16 x 16 x 16 | 665 | 30x 30 x 30 x 30 36x 36 x 36 x 36 48x 48 x 48 x 48 | 4160 | |

SLEEVE



Fig. 14P

PLUG



Fig. 14G

CAP



| Sizeinches | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 3 6 | 48 |
|--------------------------------|---------|----------|----------|----------|-----|-----|-----|-----|-----|-----|-----|-----|-------------|----|
| Weight, Sleevespounds " Plugs" | 35 8 | 45 15 | 60 20 | 75 30 | 100 | 125 | 150 | 175 | 200 | 240 | 345 | 475 | 63 0 | |
| " Caps " | 20 | 25 | 40 | 60 | 85 | 110 | 145 | 165 | 235 | 290 | 435 | 680 | 1015 | |



SPECIALS FOR CAST IRON PIPE

FLEXIBLE BALL JOINTS

HUB AND SPIGOT ENDS



Fig. 3663A

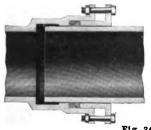
FLANGED ENDS



Fig. 3663B

| Sizeinches | 4 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|-------|--------|--------|--------|--------|--------|-----------------------|
| Price, Hub and Spigot Endseach "Flanged Ends" Diameter of Flangesinches | 18.00 | 22.00 | 33.00 | 43.50 | 54.00 | 65.00 | 70.00 75.00 23½ |
| Sizeinches | 18 | 20 | 24 | 30 | 36 | 42 | 48 |
| Price, Hub and Spigot Endseach "Flanged Ends" Diameter of Flangesinches | 97.50 | 110.00 | 130.00 | 225.00 | 340.00 | 450.00 | 550.00 |

EXPANSION JOINT PIPE, 12-FOOT LENGTHS







| Sizeinches | 4 | 6 | 8 | 10 | 12 |
|------------------------------------|------|------|------|------|-------|
| Weight per foot, Standardpounds | 22 | 34 | 47 | 64 | 82 |
| Price, Standard Weightper foot | .70 | 1.10 | 1.50 | 2.00 | 2.50 |
| Weight per foot, Medium pounds | 24 | 38 | 55 | 73 | 95 |
| Price, Medium Weightper foot | .75 | 1.20 | 1.70 | 2.25 | 3.00 |
| Weight per foot, Extra Heavypounds | 26 | 40 | 60 | 80 | 110 |
| Price, Extra Heavy Weightper foot | .85 | 1.30 | 2.00 | 2.75 | 3.50 |
| Sizeinches | 14 | . 16 | 18 | 20 | 24 |
| Weight per foot, Standardpounds | 125 | 133 | 160 | 190 | 260 |
| Price, Standard Weightper foot | 3.75 | 4.00 | 5.00 | 6.00 | 7.50 |
| Weight per foot, Mediumpounds | 140 | 150 | 180 | 225 | 300 |
| Price, Medium Weightper foot | 4.50 | 5.00 | 6.00 | 7.50 | 9.00 |
| Weight per foot, Extra Heavypounds | 145 | 175 | 205 | 250 | 350 |
| Price, Extra Heavy Weight per foot | 5.00 | 6.00 | 7.50 | 9.00 | 12.00 |

Prices include Gaskets, Clamps and Bolts.

If in less than 12-foot lengths an extra charge will be made.

SEWER PIPE AND FITTINGS STANDARD SOUTHERN LIST



Fig. 7700A PIPE

| Sizeinches | 4 | 5 | 6 | 8 | 10 | 12 | 15 |
|--------------------------|------------|-----------|-------------|--------------------|-------------|-------------|-------------------|
| Weight per foot Price | 9.20 | 12 .25 | 15 .30 | 23 .45 | 32 .65 | 45 .85 | $\frac{60}{1.25}$ |
| Sizeinches | 18 | 20 | 21. | 24 | 27 | 30 | 36 |
| Weightper foot Price | 85 1.70 | 100 | 110 2.50 | $\frac{145}{3.25}$ | 215 4.25 | 270 5.50 | 365 7.00 |

ELBOW









12 15 Size.....inches 10 4 5 Price.....each 1.80 2.75 3.50 4.75 .65 .85 1.10 24 27 30 36 21 18 20 7.50 8.25 11.00 20.00 27.50 32.50 6.50 DECREASER

"Y" BRANCH



"T" BRANCH



INCREASER



Fig. 7700E

Fig. 7700G Fig. 7700F

| "Y" | OR | "T" | BRANCHES-2 FEET | Γ |
|-----|----|-----|-----------------|---|
| | | | | |

| 1 011 1 211111 | | | | | | |
|----------------|------|------|-------|-------|-------|------|
| Size'inches | | | | | | |
| Priceeach | .90 | 1.13 | 1.35 | 2.03 | 2.93 | 3.83 |
| Sizeinches | 15 | 18 | 20 | 21 | 24 | |
| Priceeach | 5.63 | 7.65 | 10.13 | 11.25 | 14.63 | |

| INC | INCREASERS | | | | | | | | | | | | |
|------------|------------|------|-------|-------|-------|-------|-------|--|--|--|--|--|--|
| Sizeinches | 4 | 5 | 6 | 8 | 10 | 12 | 15 | | | | | | |
| Priceeach | .80 | 1.00 | 1.20 | 1.80 | 2.60 | 3.40 | 5.00 | | | | | | |
| Sizeinches | | | | | | | | | | | | | |
| Price each | 6.80 | 9.00 | 10.00 | 13.00 | 17.00 | 22.00 | 28.00 | | | | | | |

| DEC | REAS | SERS | | | | | | |
|------------|------|------|-------|-------|-------|-------|-------|--|
| Sizeinches | 4 | 5 | 5 6 | | 10 | 12 | 15 | |
| Priceeach | .80 | 1.00 | 1.20 | 1.80 | 2.60 | 3.40 | 5.00 | |
| Sizeinches | 18 | 20 | 21 | 24 | 27 | 30 | 36 | |
| Priceeach | 6.80 | 9.00 | 10.00 | 13.00 | 17.00 | 22.00 | 28.00 | |

SEWER PIPE AND FITTINGS

STANDARD SOUTHERN LIST

BRANCHES

"V" BRANCH



DOUBLE "Y" BRANCH



DOUBLE "T" BRANCH



Fig. 7701A

Fig. 7701B

Fig. 7701C

"V." DOUBLE "Y" OR "T" BRANCHES-2 FEET

| Sizeinches | 4 | 5 | 6 | 8 | 10 | 12 |
|------------|------|-------|-------|-------|-------|------|
| Priceeach | 1.35 | 1.70 | 2.03 | 3.05 | 4.40 | 5.75 |
| Sizeinches | | | 20 | 21 | 24 | |
| Priceeach | 8.45 | 11.48 | 15.20 | 16.88 | 21.95 | ••• |

"V." DOUBLE "Y" OR "T" BRANCHES-21/2 FEET

| Sizeinches | 27 | 30 | 36 |
|------------|-------|-------|-------|
| Price | 31.88 | 41.25 | 52.50 |

TRAPS

"S" TRAP

"P" TRAP

RUNNING TRAP

RUNNING TRAP WITH H. H.



Fig. 7701E



Fig. 7701F*



Fig. 7701G

5 8 10 12 6 Sizeinches 2.00 2.50 3.50 5.50 7.50 10.00

> SLANTS AND RING PIPE SLANT RING PIPE







Fig. 7701H

SLANTS

Fig. 7701J

| | | | - | | | | |
|------------|------|-------|-------|-------|-------|-------|-------|
| Sizeinches | 4 | 5 | 6 | 8 | 10 | 12 | 15 |
| Priceeach | .80 | 1.00 | 1.20 | 1.80 | 2.60 | 3.40 | 5.00 |
| Sizeinches | 18 | 20 | 21 | 24 | 27 | 30 | 36 |
| Priceeach | 6.80 | 9.00 | 10.00 | 13.00 | 17.00 | 22.00 | 28.00 |
| | R | ING P | IPE | | | | |
| Sizeinches | 4 | 5 | 6 | 8 | . 10 | 12 | 15 |
| TV | 90 | 05 | 20 | 45 | 65 | 95 | 1 95 |

| Sizeinches | 4 | 5 | 6 | 8 | 10 | 12 | 15 |
|----------------|------|------|------|------|------|------|------|
| Price per foot | .20 | .25 | .30 | .45 | . 65 | . 85 | 1.25 |
| Sizeinches | | | | | | | |
| Priceper foot | 1:70 | 2.25 | 2.50 | 3.25 | 4.25 | 5.50 | 7.00 |

WROUGHT IRON NIPPLES

CLOSE NIPPLE



Fig. 45A

SHOULDER NIPPLE



Fig. 45B

PLAIN RIGHT HAND NIPPLES

| | LENG | тн, | Inch | ES | | hes | PRI | CH | | | Price | , Ехт | RA LO | NG NIP | PLES, | Еасн | |
|----------------|-------|------|------|------|----------------|----------------|-------|------|-----|-----|-------|-------|-------|---------|-------|-------|-------|
| e se | rt | | To | ng | | Size, Inches | se or | bo | | | | L | ENGTH | , Inchi | ES | | |
| Close | Short | | 1.0 | ng | | Size | Close | Long | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 1/8 | .04 | .06 | .07 | .08 | .10 | .12 | .14 | .15 | .17 | .18 | .19 |
| 7/8 | 11/2 | 2 | 21/2 | 3 | $3\frac{1}{2}$ | 1/4 | .04 | .06 | .07 | .08 | .10 | .12 | .14 | .15 | .17 | .18 | .19 |
| 1 | 11/2 | 2 | 21/2 | 3 | 31/2 | 3/8 | .04 | .06 | .07 | .08 | .10 | .12 | .14 | .15 | .17 | .18 | .19 |
| 11/8 | 11/2 | 2 | 21/2 | 3 | $3\frac{1}{2}$ | 1/2 | .05 | .07 | .08 | .10 | .12 | .14 | .16 | .18 | .20 | .22 | .23 |
| 13/8 | 2 | 21/2 | 3 | 31/2 | 4 | 3/4 | .06 | .09 | | .11 | .13 | .17 | .18 | .20 | .22 | .24 | .26 |
| 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 1 | .08 | .13 | | .15 | .18 | .23 | .25 | .28 | .31 | .34 | .36 |
| 15/8 | 21/2 | 3 | 31/2 | 4 | 41/2 | 11/4 | .11 | .17 | | .20 | .24 | .29 | .33 | .36 | .40 | .44 | .47 |
| 13/4 | 21/2 | 3 | 31/2 | 4 | $4\frac{1}{2}$ | 11/2 | .13 | .20 | | .25 | .29 | .36 | .40 | .45 | .50 | .54 | .59 |
| 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 2 | .18 | .27 | | .32 | .38 | .50 | .54 | .59 | .65 | .72 | .77 |
| $2\frac{1}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 | $2\frac{1}{2}$ | .39 | .59 | | | .68 | .90 | .97 | 1.06 | 1.17 | 1.26 | 1.35 |
| 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 3 | .48 | .72 | | | .85 | 1.08 | 1.20 | 1.33 | 1.45 | 1.58 | 1.70 |
| $2\frac{3}{4}$ | 4 | 41/2 | 5 | 51/2 | 6 | 31/2 | .75 | 1.05 | | | | 1.30 | 1.45 | 1.60 | 1.75 | 1.90 | 2.05 |
| 3 | 4 | 41/2 | 5 | 51/2 | 6 | 4 | .85 | 1.20 | | | | 1.52 | 1.69 | 1.87 | 2.05 | 2.22 | 2.40 |
| 3 | 4 | 41/2 | 5 | 51/2 | 6 | 41/2 | 1.25 | 1.70 | | | | 2.25 | 2.50 | 2.75 | 2.95 | 3.17 | 3.40 |
| 31/4 | 41/2 | 5 | 51/2 | 6 | 61/2 | 5 | 1.55 | 2.45 | | | | 2.58 | 2.83 | 3.10 | 3.35 | 3.60 | 3.85 |
| 31/4 | 41/2 | 5 | 51/2 | 6 | 61/2 | 6 | 1.85 | 2.90 | | | | 3.05 | 3.35 | 3.70 | 4.00 | 4.30 | 4.65 |
| 31/2 | 5 | | | | | 7 | 3.20 | | | | 3.60 | 4.05 | 4.45 | 4.90 | 5.30 | 5.75 | 6.15 |
| 31/2 | 5 | | | | | 8 | 3.55 | | | | 4.05 | 4.55 | 5.05 | 5.50 | 6.00 | 6.50 | 7.00 |
| 4 | 5 | | | | | 9 | 5.25 | | | | | | 6.50 | 7.10 | 7.75 | 8,40 | 9.00 |
| 4 | 5 | | | | | 10 | 6.75 | | | | | | 8.25 | 8.90 | 9.70 | 10.40 | 11.15 |
| 4 | 5 | | | | | 12 | 8.00 | | | | | | 10,00 | 10.80 | 11.75 | 12.70 | 13.65 |

Nipples made to order from extra heavy pipe at double above list. Nipples larger than 12 inches made to order and charged as cut pipe. Threads extra.



WROUGHT IRON NIPPLES

BLACK RIGHT AND LEFT HAND NIPPLES

| | LEN | GTH. | INC | HES | | es | PRI | CES | | Pi | RICE OF | F EXT | RA LO | NG NII | PPLES, | Еасн | | |
|--|---|---|--|-------------------------|-------------------------------|---|---|---|-----|--|---|--|--|---|---|---|--|--|
| | | | | | | Inches | or | | | | | | INCH | ES | 8 | | | |
| - | Short | | Lo | ng | | Size, | Close | Long | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| 78 11 11/8 11/8 11/8 11/8 11/8 11/8 11/8 | 1½ 1½ 1½ 2 2½ 2½ 2½ 3 3 | 2 2½ 2½ 3 3 3½ 3½ 3½ | 21/2 21/2 21/2 3 31/2 31/2 4 4 5 | 3 3 3 3½ 3½ | 4 4½ 4½ 4½ 5 5 | 1/8 1/4 3/8 1/2 3/4 1 11/4 11/2 2 21/2 3 31/2 4 | .05 .05 .05 .07 .08 .11 .15 .18 .24 .52 .65 1.00 | .08 .08 .08 .10 .12 .18 .23 .27 .36 .79 .96 1.40 1.60 | .09 | .11 .11 .13 .15 .20 .27 .34 .43 | .13 .13 .16 .17 .24 .32 .39 .51 .91 | .16 .16 .18 .23 .31 .39 .48 .67 1.20 1.44 1.75 2.00 | .18 .18 .21 .25 .33 .45 .52 .72 1.30 1.60 1.95 2.25 | .20 .20 .20 .24 .27 .37 .50 .60 .80 1.40 1.77 2.15 2.50 | .23 .23 .23 .27 .29 .41 .55 .67 .87 1.55 1.93 2.35 2.75 | .25 .25 .25 .29 .32 .45 .60 .72 .96 1.68 2.10 2.55 3.00 | .27 .27 .27 .31 .35 .48 .65 .80 1.80 2.27 2.75 | |

Add 60 per cent to above prices for Galvanized Right and Left Nipples.

GALVANIZED RIGHT HAND NIPPLES

| | LE | NGTE | I. INC | HES | | es | PR | ICES | | P | RICE O | F EXT | RA LO | NG NII | PPLES, | ЕАСН | |
|--------------|-------|------|----------|-------------------------------------|-------------------------------------|-------------------|--------------|--------------|-----|-------------------|-------------------|----------------------|-------------------|--------------------|----------------------|----------------------|------------|
| | 7.0 | | | | | Inches | or | | | | | | INCH | ES | | | |
| Close | Short | | Lo | ng | | Size, 1 | Close | Long | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3/4 7/8 | 11% | 2 2 | 21/2 | 3 | 3½ 3½ | 1/8 1/4 3/8 | .06 | .11 | .12 | .15 | .17 | .21 | .24 | .26 | .29 | .31 | .34 |
| | 11/2 | 2 | 21% | 3 | 3½ 3½ | 1/2 | .06 | .11 | .12 | .15 | .17 | .21 | .24 | .26 | .29 | .31 | .34 |
| 13/8 11/2 | 2 | 21/2 | 3 | 3½ 3½ | 4 | 1 1 1 1 1 1 | .08 | .14 | | .18 | .21 | .26 | .29 .38 .51 | .32 .42 .57 | .35 .47 .63 | .38 | .4: .5: |
| 13/4 | 21/2 | 3 | 31/2 | 4 | 41/2 | 11/4 | .17 | .29 | | .32 .39 .52 | .38 .46 .61 | .45 .55 .74 | .63 .83 | .70 .93 | .03 .77 1.03 | .69 .84 1.13 | .9 |
| 21/2 | 3 | 31/6 | 31/2 | 41/2 | 5 | 21/2 | .56 | .86 | | | 1.00 1.30 | 1.26 1.60 | 1.41 1.80 | 1.56 2.00 | 1.71 2.20 | 1.13 1.86 2.40 | 2.0 |
| | 4 | 31/2 | 5 | $\frac{4\frac{1}{2}}{5\frac{1}{2}}$ | 6 | 31/2 | 1.20 | 1.10 | | | | 2.10 2.30 | 2.35 2.60 | 2.60 2.60 2.90 | 2.20 2.85 3.20 | 3.15 3.50 | 3.4 3.8 |
| 234 | 4 | 41/2 | 5 | 5½ 5½ | 6 | 41/2 | 1.35 | 1.87 2.60 | | | | 3.30 | 3.65 4.20 | 4.05 4.60 | 5.20 4.45 5.00 | 4.85 5.40 | 5.8 5.8 |
| 31/4 | 41/2 | 5 | 5½ 5½ | 6 | $\frac{6\frac{1}{2}}{6\frac{1}{2}}$ | 5 | 2.30 | 3.15 4.25 | | | 1.05 | 3.75 4.50 5.65 | 5.00 6.35 | 5.55 | 6.05 7.75 | 6.60 | 7.1 9.2 |
| 31/2 | 5 | | | | | 7 8 | 4.25 5.00 | | | | 4.95 5.80 | 5.65 6.65 | 7.50 | 7.05 8.35 | 9.25 | 8.45 10.10 | 10.9 |

STANDARD COUPLINGS FOR STEAM, GAS, AND WATER PIPE



Fig. 4553A



Fig. 4553B

| | | Fig. 4003 | A | | | | F1g. 40 | 035 | _ |
|------------------------------|---|--|-----------------------------|---|-----------------------------|------------------------|----------------------------------|---|---|
| Size of Pipe Inches | Nominal Inside Diameter Inches | Nominal Outside Diameter Inches | Nominal Length Inches | Number of Threads per Inch of Screw | Average Weight Pounds | Price Plain Each | Price Gal- vanized Each | Price Right and Left Plain Each | PriceRight and Left Gal- vanized Each |
| 1,8 | 11 | 5/8 | 7/8 | 27 | .035 | .05 | .06 | .07 | .08 |
| 14 | 35 | 11/16 | 15/6 | 18 | .050 | .05 | .06 | .07 | .08 |
| 3⁄8 | 37 | 7⁄8 | 118 | 18 | .080 | .06 | .08 | .08 | .10 |
| 1/2 | 33 | $1_{\frac{1}{32}}$ | 13/8 | 14 | .14 | .07 | .10 | .11 | .14 |
| 34 | 83 | 15/6 | 15 8 | 14 | .25 | .10 | .13 | .15 | .18 |
| 1 | 111 | 131 | 17/8 | 11½ | . 42 | .13 | .18 | .20 | .23 |
| 11/4 | 11/2 | 2 | 21/8 | 11½ | .63 | .17 | .25 | .25 | .33 |
| 11/2 | 134 | 2!4 | 23 s | 111/2 | .86 | .21 | .32 | .30 | . 41 |
| 2 | $2\frac{7}{32}$ | 235 | $25\acute{ m s}$ | 111/2 | 1.38 | .28 | .40 | .50 | .62 |
| $2\frac{1}{2}$ | 231 | $3\frac{9}{32}$ | $2\frac{7}{8}$ | 8 | 1.90 | .40 | .55 | .85 | 1.00 |
| 3 | 31/4 | 331 | 318 | 8 | 2.67 | .60 | .80 | 1.20 | 1.40 |
| $3\frac{1}{2}$ | 3 3 3 5 | 4%6 | 35 g | 8 | 3.90 | .80 | 1.05 | 1.60 | 1.90 |
| 4 | 417 | 5,16 | $3^{5}\acute{s}$ | 8 | 4.40 | 1.00 | 1.40 | 2.00 | 2.40 |
| 41/2 | 434 | $5\frac{1}{3}\frac{7}{2}$ | 3 5 ≰ | ,8 | 4.70 | 1.50 | 2.00 | 8.20 | 8.75 |
| 5 | 5_{32}^{9} | 61/4 | 41.8 | 8 | 8.50 | 1.65 | 2.25 | 9.00 | 9.65 |
| 6 | 611 | $7\frac{9}{32}$ | $4^1{}_8^{'}$ | 8 | 9.70 | 2.40 | 3.25 | 12.50 | 13.35 |
| 7 | 73 ś | $8\frac{9}{32}$ | $41_{8}^{'}$ | 8 | 11.10 | 3.25 | 4.20 | 13.00 | 13.95 |
| 8 | 83 8 | 914 | $45{}_8^{\prime}$ | 8 | 13.60 | 4.25 | 5.50 | 17.00 | 18.25 |
| 9 | 97/6 | 1056 | $51\mathrm{s}$ | 8 | 17.40 | 5.50 | 7.00 | 17.50 | 19.00 |
| 10 | 107/6 | 115% | 61% | . 8 | 31.10 | 7.50 | 9.75 | 23.00 | 25.25 |
| 11 | 11 \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | $12\frac{21}{32}$ | 61% | 8 | 33.20 | 10.00 | 12.85 | 24.25 | 27.10 |
| 12 | 1276 | 137/8 | 61 8 | 8 | 44.20 | 10.00 | 13.65 | 28.00 | 31.65 |
| 13 | 13"16 | 153/16 | 6.3/16 | 8 | 49.20 | 12.50 | 16.50 | •••• | •••• |
| 14 | $14\frac{23}{32}$ | 16³ ý | 63/6 | 8 | 61.00 | 18.75 | 23.85 | •••• | •••• |
| 15 | 15" ₁₆ | 17 13 | 6^{3}_{16} | 8 | 64.00 | 25.00 | 30.25 | •••• | •••• |

WROUGHT IRON COUPLINGS

RECESSED



Fig. 4554A

HYDRAULIC

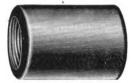


Fig. 4554B

RECESSED

| Sizeinches | 1/2 | 3/4 | 1 1 | 11/2 | 2 | 21/2 3 | 3½ | 4 |
|--------------------------------|------------|------------|----------------|------------------|------------|-----------------------------|-------------------------|---------------------|
| Price, Plain each "Galvanized" | .24 .28 | .28 .33 | .33 . .38 . | 40 .50 50 .65 | .65 .85 | $1.85\ 1.30$ $1.10\ 1.60$ | $\substack{1.65\\1.95}$ | $\frac{2.05}{2.45}$ |

HYDRAULIC

| Sizeinches | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------|-----|-----|-----|------|------|------|------|------|------|------|
| Price, Plain each | .14 | .20 | .26 | .34 | . 42 | .56 | . 80 | 1.20 | 1.60 | 2.00 |
| " Galvanized" | .20 | .25 | .32 | . 42 | .55 | . 75 | 1.05 | 1.50 | 1.90 | 3.00 |

HYDRAULIC RECESSED

| Sizeinches | 1/2 | 3, | 1 | 114 | 1½ | 2 | 21,2 | 3 | 31/2 |
|-------------------------------|---------------------|--------------|--------------|--------------|---------------|---------------|----------------|-----------------------|---------------------|
| Price, Plaineach "Galvanized" | .25 | .30 | .35 | .45 .55 | .55 | .70 | .95 1.20 | 1.40 1.70 | $\frac{1.85}{2.15}$ |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Price, Plaineach "Galvanized" | $\frac{2.25}{3.25}$ | 4.00 5.70 | 4.80 6.90 | 5.60 8.00 | 7.70 11.10 | 8.00 11.60 | 10.00 14.50 | $\frac{12.00}{17.50}$ | |

DRIVE PIPE COUPLING WITH PATENT PROTECTING SLEEVE

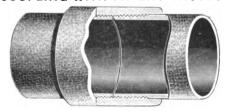


Fig. 4554C

| Sizeinches | 4 | 5 | 6 | 7 | 8 | 9 |
|--|---------------------------|---|---|--|---------------------------------|-----------------------------------|
| External Diameterinches Threads per inch of Screw. Weight eachpounds Priceeach | 5.1250 8 6.062 1.50 | $\begin{array}{r} 6.2500 \\ 8 \\ 8.812 \\ 2.40 \end{array}$ | 7.3750 8 11.562 2.80 | 8.3750 8 16.500 3.85 | $9.6250 \\ 8 \\ 25.500 \\ 4.00$ | 10.4375 8 21.500 5.00 |
| Sizeinches | 10 | 11 | 12 | 13 | 14 | 15 |
| External Diameterinches Threads per inch of Screw. Weight eachpounds Priceeach | 8 | 12.9062 8 26.500 | $ \begin{array}{r} 13.7500 \\ 8 \\ 35.500 \\ 8.00 \end{array} $ | $ \begin{array}{c} 15,4375 \\ 8 \\ 49,000 \\ \dots \end{array} $ | 16.3125 8 55.000 | $17.5000 \\ 8 \\ 72.500 \\ \dots$ |

LIST OF SIZES MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION Adopted June 5, 1907

ELBOWS

| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
|---|
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |
| 45° ELBOWS |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ |
| RIGHT AND LEFT ELBOWS |
| 14 A 38 A 12 B 34 B 1 B 14 C 11/2 C 2 C |
| STREET ELBOWS |
| $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ |
| 45° STREET ELBOWS |
| 1/2 B 3/4 B 1 B 11/4 B 11/2 B 2 B |
| 60° ELBOWS |
| 1¼ B 1½ B 2 B |
| SIDE OUTLET ELBOWS |
| |
| $\frac{3}{2}$ \frac |
| $\frac{3}{8}x^{3}\sqrt{x}\frac{1}{4}\frac{ B }{ 2}\frac{1}{2}x\frac{1}{2}x^{3}\frac{1}{8}\frac{ B }{ B }\frac{3}{4}x^{3}\sqrt{x}\frac{3}{8}\frac{ B }{ 3}\frac{3}{4}x^{3}\sqrt{x}\frac{3}{4}\frac{ B }{ B }\frac{1}{3}x^{3}\sqrt{x}\frac{3}{4}\frac{ B }{ B }\frac{1}{1}\frac{x}{1}\frac{x}{1}\frac{ B }{ B }\frac{1}{1}\frac{1}{4}x\frac{1}{1}\frac{1}{4}\frac{ B }{ B }\frac{2x^{2}x^{2}}{ B }\frac{ B }{3}\frac{2x^{2}x^{2}}{ A }\frac{ B }{ A }\frac{1}{4}x\frac{1}{1}\frac{1}{4}x\frac{1}{1}\frac{1}{4}x\frac{1}{1}\frac{1}{4}\frac{ B }{ B }\frac{2x^{2}x^{2}}{ B }\frac{ B }{3}\frac{2x^{2}x^{2}}{ A }\frac{ B }{ A }\frac{ A }{4}\frac{ A }{4}\frac$ |
| DROP ELBOWS-FEMALE |
| |
| DROP ELBOWS-FEMALE |
| DROP ELBOWS-FEMALE 1/4 x 1/4 B 3/8 x 1/4 B 3/8 x 3/8 B 1/2 x 1/2 B 3/4 x 1/2 B 3/4 x 3/4 B |
| $\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$ |
| DROP ELBOWS-FEMALE |

LIST OF SIZES MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION

Adopted June 5, 1907

TEES-STRAIGHT AND REDUCING

| 1/8x1/8x1/8 | A | 3/4 x 3/4 x 1/2 | В | 11/4 x1 x 1/2 | В | 1½x1¼x2 | C | 3 x3 x1 | C |
|---|---------------------|---|----------------------|--|----------------------|--|--------------------|--|----|
| 1/8 x 1/8 x 1/4 | A | 34x 34x 34 | C | $1\frac{1}{4}$ x1 x $\frac{3}{4}$ | $\bar{\mathbf{C}}$ | $1\frac{1}{2}x1\frac{1}{2}x2$ | Č | $3 \times 3 \times 1\frac{1}{4}$ | Č |
| 14x14x1/8 | A | 1/2x 1/2x1 | В | 11/4x1 x1 | Č | 2 x 3/8 x 2 | B | $3 \times 3 \times 1\frac{1}{2}$ | Č |
| 14x14x14 | В | 34x 38x1 | В | 11/4x1 x11/4 | Č | $2 \times \frac{1}{2} \times 2$ | $\bar{\mathbf{B}}$ | 3 x3 x2 2 | Č |
| 14x14x38 | $\bar{\mathbf{B}}$ | 34x ½x1 | B | 114x114x 38 | B | $\frac{1}{2}$ x $\frac{3}{4}$ x2 | Ċ | 3 x3 x21/2 | Č |
| 38x14x14 | B | 34x 34x1 | č | 11/4 x 11/4 x 1/2 | В | $\frac{2}{2}$ $x1^4$ $x2$ | č | 3 x3 x3 | Č |
| 3/8 x 1/4 x 3/8 | $\ddot{\mathbf{B}}$ | 1 x 3 x 1/2 | B | 114x114x 34 | č | $\frac{2}{2}$ $x1\frac{1}{4}x1\frac{1}{4}$ | č | 31/2x31/2x21/2 | č |
| 3/8×3/8×1/8 | Ā | 1 x 3/8x 3/4 | $\tilde{\mathbf{B}}$ | 114x114x1 | Č | $\frac{1}{2} x \frac{1}{4} x \frac{1}{2}$ | č | $3\frac{1}{2}x3\frac{1}{2}x3$ | č |
| 3/8 x 3/8 x 1/4 | В | 1 x 3 x1 4 | $\ddot{\mathbf{B}}$ | 11/4x11/4x11/4 | č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | 31/2×31/2×31/2 | č |
| 3/8×3/8×3/8 | B | 1 x 1/2x 3/8 | В | 1 x1 x1½ | č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | 4 x3 x4 | ľč |
| 38x38x1/2 | В | 1 x ½x ½ | В | 11/4x1 x11/2 | č | $\frac{2}{2} x_{1} \frac{1}{2} x_{1} \frac{1}{4}$ | č | 4 x4 x1 | ľč |
| | В | $1 \times \frac{1}{2} \times \frac{2}{3}$ | $\ddot{\mathbf{B}}$ | $1\frac{1}{4}x1\frac{1}{4}x1\frac{1}{2}$ | č | $\frac{2}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ | č | 4 x4 x11/4 | ď |
| $\frac{1}{2}$ $\frac{1}{4}$ \frac | В | $1 \times \frac{1}{2} \times 1$ | В | 11/2x 3/5x11/2 | $\mathbf{\tilde{B}}$ | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | $1 \times 4 \times 11\frac{1}{2}$ | č |
| 1/2x3/8x3/8 | В | 1 x 34x 34 | В | 11/2x 1/2x11/2 | В | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | В | 4 x4 x2 | č |
| $\frac{1}{2}x^{3}8x^{1}2$ | В | 1 x 3/x 1/2 | В | 1½x ¾x ¾ | Č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | 4 x4 x21/2 | č |
| 724%8472 1/-1/-1/ | В | | Č | 1½x ¾x1½ | č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | Č | 4 x4 x3 | ĕ |
| $\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{1}{4}$ | В | | č | 11/2x1 x1 | č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | 4 x4 x31/6 | č |
| 1/2x1/2x3/8 | В | · - /4 · | В | | č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | 4 x4 x4 | ď |
| 1/2 x 1/2 x 1/2 | В | /4 | В | 11/2x1 x11/4 | č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | | ď |
| 3/8 x 3/8 x 3/4 | B | | В | 1½x1 x1½ | č | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | č | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | ď |
| 1/2x3/8x3/4 | В | 1 x1 x ½ | Č | 1½x1¼x ¾ | č | 01/-01/- 3/ | č | | č |
| $\frac{1}{2}$ x $\frac{1}{2}$ x $\frac{3}{4}$ | В | $1 \times 1 \times \frac{34}{4}$ | č | 11/2x11/2x1 | č | $2\frac{1}{2}x2\frac{1}{2}x$ $3\frac{7}{4}$ | č | | ď |
| $\frac{3}{4}$ x $\frac{1}{4}$ x $\frac{3}{4}$ | | 1 x1 x1 | č | 1½x1¼x1¼ | | $21/2 \times 2 \times 21/2$ | č | | |
| 34 x 3 x 3 x 3 s | B | $1 \times \frac{3}{4} \times \frac{1}{4}$ | Č | 11/2x11/4x11/2 | C | 21/2x21/2x1 | č | | C |
| 34 x3 5 x1/2 | | $1 \times 1 \times 11_4$ | В | 11/2x11/2x 3 8 | В | $2\frac{1}{2}x2\frac{1}{2}x1\frac{1}{4}$ | | | |
| $\frac{3}{4}$ x ³ 8 x $\frac{3}{4}$ | B | 11/4x 3/x11/ | | 1½x1½x ½ | B | $2\frac{1}{2}x2\frac{1}{2}x1\frac{1}{2}$ | C | 6 x6 x3 | C |
| 34 x1/2 x14 | B | 114x 1/2x1 | В | 1½x1½x ¾ | C | 2½x2½x2 | C | 6 x9 x4 | C |
| $\frac{3}{4}$ x $\frac{1}{2}$ x $\frac{3}{4}$ | B | 114x 1/2x114 | B | 1½x1½x1 | C | $21\sqrt{2} \times 21\sqrt{2} \times 21\sqrt{2}$ | C | 6 x6 x6 | C |
| 34x1/2x1/2 | B | 114x 34x 34 | Ç | 1½x1½x1¼ | C | 2½x2½x3 | Č | | •• |
| $\frac{34}{4}$ x $\frac{1}{2}$ x $\frac{3}{4}$ | B | 11/4 x 3/4 x 1 | \mathbf{C} | 1½x1½x1½ | Č | $2 \times 2 \times 3$ | Č | · · · · · · · · · · · · · · · · · · · | |
| 34 x34 x14 | B | 11/4 x 3/4 x 11/4 | C | 1 x1 x2 | Č | 3 x2 x3 | C | | |
| 34 x34 x3 8 | B | 114x1 x 3 | В | 11/4 x 11/4 x 2 | \mathbf{C} | $3 \times 3 \times \frac{3}{4}$ | \mathbf{C} | 1 | 1 |

SERVICE TEES

| 3/8 x 3/8 x 3/8 B 1 x 3/4 x 1 1/2 x 1/2 B 1 x 1 x 1 | B 11/4x11/4x11/4 C 11/4x1 x1 | C 2 x1½x1½x1½ C 2 x1½x2 | C 3 x2½x3 C 3 x3 x4 | CC |
|--|--|---|---|-----|
| 34x34x 34 B 1 x1 x114 34x12x 34 B 114x 34x114 | C 11/2x 3/4x11/2 | C 2 x2 x2 C 216x2 x216 | $\mid \stackrel{\mathbf{C}}{\mathbf{C}} \parallel \cdots \cdots \mid$ | |
| 34x34x1 B 114x1 x114 | $C 1\frac{1}{2} \times 1\frac{1}{4} \times 1\frac{1}{2} $ | $C \mid 2\frac{1}{2}x2\frac{1}{2}x2\frac{1}{2}$ | C | ٠٠. |

REDUCERS

| 1/4×1/8 | A | 3/4 x3/8 | В | 1½x½ 1¼x¾ 1¼x1 1½x½ | В | 2 | x 1/2 | В | 21/2 | x11/2 | C | 31 | 2x2 | C | 4 | $x^{21/2}$ | C |
|-----------|---|-----------|---|------------------------------|----|----|--------|---|------|-------|---|-----|--------|---|---|------------|---|
| 3/8×1/8 | A | 3/4 X 1/2 | В | 11/4 x 3/4 | C | 2 | X 3/4 | C | 21/9 | x2 | C | 31 | 2x21/2 | C | 4 | x3 | C |
| 3/8×1/4 | В | 1 x1/4 | В | 11/4×1 | C | 2 | x1 | C | 3 | x1 | C | 31 | 6x3 | C | 4 | x31/2 | C |
| 1/2×1/8 | A | 1 x3/8 | В | 11/2x 1/2 | В. | 2 | x11/4 | C | 3 | x11/4 | C | 4 | x1 | C | | | |
| 1/2X1/A | B | 1 X 1/2 | B | 11/2X % | C | 12 | X11/2 | C | 0 | X11/2 | U | 1 4 | XII | C | | | |
| 1/2x3/8 | В | 1 x3/4 | В | 11/2x1 | C | 21 | 2x1 | C | 3 | x2 | C | 4 | x11/2 | C | | | |
| 3/4 x 1/4 | B | 11/4 x3/8 | B | 1½x1 1½x1¼ | C | 21 | 2x11/4 | C | 3 | x21/2 | C | 4 | x2 | C | | | |

LIST OF SIZES MALLEABLE IRON FITTINGS

REVISED CLASSIFICATION

Adopted June 5, 1907

3/8 | B || 1/2 | B || 3/4 | B || 1/4 | B || 3/8 | B || 1/2 | B || 3/4 | B || 1 || B || 11/4 || B || 11/2 || B



CLASSIFICATION

| Class | A | В | C |
|---|--|---|---|
| Caps | | 14 to 1 inclusive | 1¼ and larger |
| Chandelier Hooks | | all sizes | -/4 mind mige. |
| " Loops | ••••• | all sizes | |
| Couplings, R. H | ••••• | | 1 and larger |
| " R. and L | | 14, 38, 16 and 34 14, 38, 12 and 34 | 1 and larger |
| it. and D | (½ x ½ | 74, 98, 72 and 94 | I allu laigei |
| " Reducing | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 3/-1/4-1-3/ | *11/ |
| Reducing | $\begin{cases} 3_{8}^{2} \times 1_{8}^{2} \\ 1_{2} \times 1_{8}^{2} \end{cases}$ | 38x 1/4 to 1x34 | *1¼ and large |
| Crosses | | ¼ to 1 inclusive | $1\frac{1}{4}$ and large |
| " Reducing | | 1 and smaller | $*1\frac{1}{4}$ and large |
| ~ | (1/-1/ | (3/8 x 1/4 | |
| Elbows | $\begin{cases} \frac{1}{8} \times \frac{1}{8} \\ \frac{1}{4} \times \frac{1}{8} \end{cases}$ | 1 1 1/2 x 1/4 | *3/ and le |
| EMDUWS |) 4 × 78 | $\begin{cases} \frac{1}{2} \times \frac{1}{4} \\ \frac{1}{4}, \frac{3}{8}, \frac{1}{2} \end{cases}$ | *¾ and large |
| 1 | $(\frac{3}{8} \times \frac{1}{8})$ | 1/2 x 3/2 | |
| Elbows, 45° | | $\frac{1}{2} \times \frac{3}{8}$ 14 to 2 inclusive | 2½ and large |
| " 60° | | 1½ to 2 | -/2 |
| " Drop | | all sizes | |
| " R. and L | 14, 3/8 | 1/2, 3/4, 1 | *11/4 and large |
| " Side Outlet | /41 /8 | all sizes | 1/4 una iaige |
| Side Oddiev | | (1/4, 3/8, 1/2, 3/4 | ••••• |
| " Street | | $ \begin{cases} 74, 78, 72, 74 \\ 34 \times 12 \end{cases} $ | 1 and larger |
| Street | | $1 \times \frac{1}{2}, 1 \times \frac{3}{4}$ | Tand larger |
| " " 45° | ••••• | $\frac{1}{2} to 2$ | |
| Extension Pieces. | | all sizes | ••••• |
| Lockmuta | • | | 11/ and large |
| Locknuts | • | 14 to 114 inclusive | 11% and large |
| Return Bends | 9/ 1/ | 1 and smaller | $1\frac{1}{4}$ and large |
| " " R. and L | 3/8, 1/2 | 34 and larger | • |
| • | (1/ 1/ | 14, 3/8, 1/2 | |
| 1. | (1/8 x 1/8 | 14 x 14 x 3/8 | |
| Tees | $\int \frac{18}{8} \times \frac{13}{14}$ | 3/8×1/4×1/4 | *34 and larger |
| | 14 x 18 38 x 18 | 3/8×3/8×1/4 | , 4 |
| | (38 x 1/8 | $\frac{3}{8}$ x $\frac{1}{4}$ x $\frac{3}{8}$ | |
| _ | | 1½ reducing | |
| Tees, Drop | | all sizes | |
| " Four-Way | | all sizes | |
| " Street | | \ \begin{array}{cccccccccccccccccccccccccccccccccccc | 1 and larger |
| Wall Plates | | all sizes | |
| Waste Nuts | • | all sizes | |
| ** ************************************ | • | all sizes | ••••• |
| Y Bends | | | |

PRICES

| Class | Α . | В | C |
|---------------------------------------|-----|-----|-----|
| Price, Black per pound " Galvanized " | .40 | .20 | .12 |
| " Galvanized " | 50 | 28 | 19 |

^{*}Fittings in Class C having one or more outlets smaller than $\frac{3}{4}$ will be charged in Class B.

Orders for less than 25 pounds of Black Fittings in Classes B and C will be charged at a uniform price of 20 cents per pound, and in Class A at 40 cents per pound.

PLAIN.





45°, READED



Fig. 687A

Fig. 687B

Pig. 687C

STRAIGHT AND REDUCING

| Size inches | 1/8 | 1/4 | 3/8 | 1/2 | 3⁄4 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|-------------|-----|-----|-----|-----|-----|------|-----|------|-----|------|------|------|------|------|------|-------|
| Black each | .06 | .07 | .08 | .10 | .15 | .22 | .25 | .35 | .50 | .90 | 1.50 | 2.25 | 3.00 | 3.50 | 4.00 | 6.50 |
| Gal " | | .09 | .11 | .14 | .20 | . 32 | .40 | .60 | .90 | 1.50 | 2.60 | 3.75 | 5.00 | | 6.50 | 10.00 |

RIGHT AND LEFT

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 114 | 11/2 | 2 |
|--------------|-----|-----|-----|-----|-----|-----|------|------|
| Blackeach | .09 | 11 | .13 | .17 | .25 | .30 | .40 | ,65 |
| Galvanized " | | | .17 | .23 | .35 | .45 | .65 | 1.00 |

45° AND 60°

| Size | | inc | ches | 1,4 | 3/8 | 1/2 | 34 | 1 | 1!4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 |
|-------|-------|----------|------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|-------|
| 45° [| Elbow | s, Blk.e | ach | .08 | .10 | .12 | .18 | .26 | .36 | .54 | .82 | 1.25 | 2.50 | 3.25 | 4.50 | 6.00 | 7.50 |
| " | ** | Gal. | 44 | .12 | .15 | .20 | .25 | .40 | .50 | .85 | 1.35 | 1.90 | 3.75 | 4.75 | 6.75 | 9.00 | 11.00 |
| 60° | " | Blk. | " | | | ا ا | | ١ ا | .30 | .45 | . 65 | ١ | ١ ا | ۱ ۱ | ١ | | |
| 66 | 66 | Gal. | " | ١ | | ١ ١ | ٠ | ١ ا | .45 | .70 | 1.05 | ١ | | | | | |

STREET



DROP, FEMALE



Fig. 687D

Fig. 687E



Fig. 687F

STREET

| Size | | • · · · · · • • · · · · · · · · · · · · | inches | 14 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 4 |
|--------|---------|---|--------|-----|-----|------|-----|-----|------|------|------|------|------|------|
| Street | Elbows, | Black | each | .10 | .10 | .12 | .20 | .25 | | ,00 | | | | 3.50 |
| 44 | " | Galvanized. | •• | .12 | .12 | . 15 | .28 | .35 | .55 | .80 | 1.30 | 2.25 | 3.50 | |
| 44 | " | 45° Black | " | | | .12 | .20 | .25 | .40 | .55 | .90 | | | |
| 66 | 44 | " Galvaniza | ed " | | l I | 15 | 28 | 35 | 55 | 80 | 1 30 | | ١ | ١ |

SIDE OUTLET

| Sizeinches | 3/8 | 1/2 | 34 | 1 | 14 | 11/2 | 2 |
|-------------|-----|------|-----|------|-----|------|------|
| Blackeach | .05 | . 10 | .18 | .30 | .45 | .60 | 1.00 |
| Galvanized" | .10 | . 15 | .25 | . 45 | .65 | .90 | 1.50 |

| DRO | Ρ | | | LONG DROP | | | | | | | | |
|--------------------|-----|------|---------|----------------|------|------|----------|-----------|--|--|--|--|
| Sizeinches | | | | | | | 1/2 x3/8 | 1/2 x 1/2 | | | | |
| Female, Black each | .06 | . 08 | 12 - 20 | Black each | .10 | .10 | .18 | .18 | | | | |
| " Gal " | | | | o∥Gal" | | .18 | .27 | .27 | | | | |
| Male and Female " | | . 08 | 12 | Drop Lengthin. | 23/8 | 21/2 | 31/8 | 31/6 | | | | |
| " " Gal" | | | | <u> </u> | | | | <u> </u> | | | | |









Fig. 688A

Fig. 688B

Pig. 688C

STRAIGHT AND REDUCING

| Size inches | 1/8 | 14 | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|--------------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|----------|------|-------|
| Black each | .07 | .08 | .09 | .11 | .15 | .25 | .30 | .45 | .60 | 1.05 | 1.70 | 2.50 | 3.40 | 4.25 | 5.00 | 7.75 |
| Galvanized " | .09 | .10 | .13 | .16 | .20 | .38 | , 50 | .70 | 1.00 | 1.90 | 3.00 | 4.25 | 5.75 | <u> </u> | 8.00 | 12.00 |

SERVICE

| Size inches | 3 8 | 1/2 | 34 | 1 | 11/4 | 1½ | 2 | 21/2 | 3 x 2 ½ x 3 | 3x3x4 |
|--------------|------|-----|-----|-----|------|------|------|------|-------------|---------|
| Black each | .12 | .15 | .25 | .35 | .50 | .75 | | 2.00 | 2.50 | 4.00 |
| Galvanized " | . 15 | .20 | .35 | .50 | .70 | 1.10 | 1.65 | | | • • • • |

FOUR-WAY



Fig. 688D

DROP



Pig. 688E

FOUR-WAY AND DROP

| Sizeinches | 3/8 | 1/2 | 34 | 1 | 114 | 114 | 2 |
|-------------------------------------|-----|-----|-----|------------|------------|-----|---------------------|
| Four-Way Tees, Blackeach Galvanized | .12 | .14 | .20 | .35 | .50 .70 | | $\frac{1.25}{1.75}$ |
| Drop Tees, Black | .10 | | .22 | .30 .55 | | | |
| Male and Female, Black | .10 | .14 | .22 | .30 | | | •••• |

LONG DROP

| Size inches | 3 8 | $\frac{34}{4}$ x $\frac{34}{4}$ x $\frac{1}{2}$ | 1x1x12 | 114x114x14 |
|--------------|-----|---|--------|------------|
| Blackeach | .12 | .30 | .40 | .60 |
| Galvanized " | 17 | | | |

PLAIN

CROSSES

BEADED





| - 4 | 66 | ø | 9 | |
|-----|----|---|-----|--|
| Fi | g. | 6 | 88F | |



Fig. 688G

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 |
|--------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|---|---|
| Blackeach | | | | | | | | | | | | | | |
| Galvanized " | .12 | .14 | .25 | .29 | .45 | .60 | .90 | 1.50 | 2.75 | 4.50 | | 8.00 | | |

RUSHING

PACED BUSHING

LOCKNUT

PACED LOCKNUT









Pig. 4825C

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | | |
|--------------|-----|-----|-----|-----|-----|------|------|-----|------|--|--|
| Blackeach | | | | | | | | | | | |
| Galvanized " | .08 | .08 | .08 | .10 | .12 | .14 | .18 | .28 | .42 | | |

BUSHINGS

| F | Α | C | EC | B | US | SH | IN | GS |
|---|---|---|----|---|----|----|----|----|
| | | | | | | | | |

| Sizeinches | 3 % | 1/2 | 3/4 | 1 | 114 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|------------|----------|----------|-------|-----|-----|------|-----|----------------|------|------|------|------|---------|------------|
| Blackeach | .08 | .09 | | | | | | | | | | 2.10 | 2.60 | 3.75 |
| Galv " | . | . | • • • | .20 | .25 | .33 | .48 | .72 | 1.05 | 1.80 | 2.25 | | | . |

LOCKNUTS

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|-------------|-----|-----|-----|-----|-----|------|------|-----|
| Blackeach | .02 | .03 | .04 | .05 | .07 | .09 | .11 | .18 |
| Galvanized" | .03 | .04 | .05 | .07 | .10 | .14 | .20 | .30 |

FACED LOCKNUTS

| Sizeinches | 1/4 | 3 8 | 1/2 | 3⁄4 | 1 | 114 | 11/2 | 2 | 21/2 | 3 |
|--------------|-----|-----|-----|-----|-----|-----|------|-----|------|-----|
| Black each | .08 | .09 | .10 | .12 | .15 | .20 | .25 | .30 | .35 | .45 |
| Galvanized " | .11 | .13 | .15 | | .22 | .30 | .35 | .45 | .50 | .65 |

HEXAGON NIPPLE



EXTENSION PIECE











Fig. 4825G

HEXAGON NIPPLES RIGHT AND LEFT

| Sizeinches | 14 | 3/8 | 1/2 | 3/4 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|------------------|----|-----|-----|-----|---|-----|------|---|------|---|------|---|
| Price, Blackeach | | | | | | | | | | | | |

Right Hand hexagon nipples made to order at a special price.

WASTE NUTS

| Sizeinches | 14 | 3/8 | 1/2 | 3/4 | _1_ | 11/4 | 11/2 |
|----------------------|-----|-----|-----|-----|-----|------|------|
| Blackeach Galvanized | .04 | .05 | .06 | .08 | .10 | .15 | .25 |
| | .08 | .10 | .12 | .16 | .20 | .30 | .50 |

EXTENSION PIECES

| Sizeinches 3 | <u>'8</u> | _ 72_ | % |
|--------------------------|-----------|-------|-----|
| Black each Galvanized "0 |)6)9 | .09 | .12 |

RETURN BENDS

CLOSE



Fig. 690A

MEDIUM



Fig. 690B

OPEN



Fig. 690C

CLOSE PATTERN

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 1½ | 2 |
|------------------------|------|------|------|------|------|------|
| R. H., Black each | . 18 | .25 | .35 | . 50 | .75 | 1.00 |
| " Galvanized " | .25 | . 35 | . 55 | .75 | 1.15 | 1.65 |
| R. and L., Black | .23 | .30 | .45 | .60 | .90 | 1.25 |
| " Galvanized " | | .40 | .65 | | | |
| L. H., Black | .23 | .30 | .45 | .60 | .90 | 1.25 |
| Center to Centerinches | 1 | 11/4 | 11/2 | 13/4 | 23/6 | 25/8 |

MEDIUM PATTERN

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|-------------------------|------|------|------|------|------|------|
| R. H. Blackeach | .18 | . 25 | .35 | . 50 | .75 | 1.00 |
| " Galvanized " | . 25 | . 35 | . 55 | .75 | 1.15 | 1.65 |
| R. and L. Black " | .23 | .30 | .45 | . 60 | .90 | 1.25 |
| " Galvanized " | | .40 | .65 | | | |
| L. H. Black " | .23 | .30 | .45 | . 60 | .90 | 1.25 |
| Center to Center inches | 11/4 | 11/2 | 17/8 | 21/4 | 21/2 | 3 |

OPEN PATTERN

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|-------------------------|------|------|----------------|------|------|------|------|------|
| R. H., Black each | | . 30 | . 50 | .65 | .85 | 1.25 | 2.00 | 3.00 |
| " Galvanized " | .28 | .45 | .70 | .90 | 1.25 | 2.00 | 3.50 | 5.00 |
| R. and L., Black | .25 | .38 | .60 | .80 | 1.05 | 1.55 | 2.50 | 3.75 |
| " Galvanized " | | . 55 | .80 | | | | | |
| L. H., Black | . 25 | .38 | .60 | .80 | 1.05 | 1.55 | 2.50 | 3.75 |
| Center to Center inches | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 |

SPECIAL WIDE PATTERN-RIGHT HAND

| Sizeinches | 3/8 | 3/4 | 3/4 | 1 | 11/4 | 11/2 | 2 | 3 | 3 | 4 | 6 |
|-------------------------|------|------|--------|----|------|------|------|------|------|------|-------|
| Blackeach | .25 | 1.00 | 1.251. | 25 | 1.25 | 2.00 | 3.00 | 5.00 | 5.00 | 8.00 | 16.00 |
| Galvanized " | | | | | | | | | | | |
| Center to Center inches | 11/2 | 4 | 6 6 | 6 | 6 | 6 | 5 | 71/2 | 8 | 6 | 12 |

EXTRA HEAVY

| Sizeinches | | | | | | | | | | | | 2 | 2 |
|-------------------------|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Blackeach | .60 | .75 | .85 | .90 | .95 | 1.00 | 1.15 | 1.20 | 1,55 | 1.15 | 1.25 | 1.30 | 1.90 |
| Conter to Center inches | 13/4 | 21/2 | 3 | 21/4 | 21/2 | 3 | 31/2 | 4 | 6 | 3 | 3 | 31/2 | 4 |



Y BRANCH



Fig. 691A

CROSS-OVER



Fig. 691B Y BRANCHES

CROSS-OVER TEE



Fig. 691C

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 11/4x3/4 | 11/2 | 11/2×11/4 | 2 |
|-------------------------------|--|--|--------------|-------------|--------------|--------------|--------------|--------------|
| Price, Blackeach "Galvanized" | .40 .60 | .50 .75 | .60 .90 | .80 1.25 | .80 1.25 | 1.00 1.50 | 1.00 1.50 | 1.70 2.50 |
| Sizeinches | | | | 2½x2 | 3 | 3x21/2 | 4 | • • • • |
| Price, Blackeach "Galvanized" | $\begin{bmatrix} 1.70 \\ 2.50 \end{bmatrix}$ | $\begin{bmatrix} 1.70 \\ 2.50 \end{bmatrix}$ | 2.00 3.00 | | 4.00 6.00 | 4.00 6.00 | 5.50 8.25 | |

| 60° Y BRAN | ICHE | :S | CROSS | CROSS-OVER | VER TEES | | | | |
|----------------------------|------|------|--------------------------|------------|----------|---|------------|-----|-----|
| Sizeinches | 2 | 2x1½ | Sizeinches | 1/2 | 3/4 | 1 | Sizeinches | 1/2 | 3/4 |
| Blackeach Galvanized. " | | | Blackeach Galvan'd. " | | | | | .38 | .56 |
| COUPLINGS | | | | | | | CA | AP | |

REDUCING



Fig. 691D

COUPLINGS R. H.



Fig. 691E

R. & L.



Fig. 691F REDUCING COUPLINGS



Fig. 691G

| Sizeinches | 14 | 3/8 | 1/2 | 3/4 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|------------------|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| Price, Blackeach | .05 | 06 | .07 | .10 | . 16 | . 20 | .28 | . 45 | .70 | 1.00 | 1.50 | 1.85 |
| 46 (1-1 | (1) | 10 | 10 | 1 . | 0.5 | 95 | 45 | 75 | 1 05 | 1 05 | 0 40 | 0 0= |

| Price, Blackeach "Galvanized" | .03 .10 | .10 .15 | .25 .3 | .45 | .75 1.0 | 05 1.65 | $\frac{2.40}{3.05}$ | | |
|-------------------------------|---------|---------|--------|-----|---------|---------|---------------------|--|--|
| RIGHT HAND COUPLINGS | | | | | | | | | |

| Sizeinches | 14 | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 |
|---------------------------------|------------|------------|------------|------------|-----|------|------------|------------|
| Price, Black each "Galvanized " | .03 .05 | .05 .07 | .07 .10 | .10 .17 | .14 | .30 | .25 .40 | .35 .55 |

| RIGHT AND LEFT COUPLINGS | | | | | | | | | | |
|--------------------------|---|----------|--|--|--|--|--|--|--|--|
| Sizeinches | 14 38 1/2 34 1 11/4 11/2 2 21/4 | 3 | | | | | | | | |
| Price, Blackeach | .04 .06 .08 .12 .16 .25 .36 .52 | 01.00 | | | | | | | | |
| " Galvanized " | . (6, .09 .10 .17 .25 .36 .55 .75 1.0 | 5 1.50 | | | | | | | | |

| CAPS | | | | | | | | | | |
|-------------------|----------|---------|-----|---------|---------|------|------------------------|------|------|-------|
| Sizeinches | 1/4 3/8 | 1/2 3/4 | 1 | 114 114 | 2 | 21/2 | 3 31/2 | 4 | 5 | 6 |
| Price, Black each | T.03; 04 | .05 .08 | 12 | 16 .2 | 4 .32 | .45 | .851.00 | 1.20 | 2.50 | 3.50 |
| " Galvan'd. " | .04 .05 | .08 .12 | .17 | .24 .3 | 3 .52 | .76 | L.30 _, 1.60 | 2.00 | | • • • |

MALE

UNION FIROWS



Fig. 692B

Fig. 692A 3/8 34 21/6 Size.....inches 1/2 114 11/6 .45 .48 .72 Male Union Elbows, Black.....each .43 .62 1.05 1.20 1.80 3.30 Female Union Elbows, ".....
Male Union Elbows, Galvanized... .40 .38 .42 .54 .63 .90 1.05 1.55 2.85 $. ilde{72}$ 65 .70 .93 1.08 1.80 2.70 1.60 4.95 2.35 Female Union Elbows .60 .63 .81 .95 1.35 1.58 4.30

MALE

UNION TEES

FEMALE



Fig. 692C

Fig. 692D

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 |
|-------------------------------|-----|-----|-----|------|------|------|------|------|------|
| Male Union Tees, Blackeach | | | | | | | | | |
| Female Union Tees, " " | .40 | .43 | .45 | .57 | .70 | .95 | 1.15 | 1.70 | 3.20 |
| Male Union Tees, Galvanized " | .72 | .75 | .78 | 1.00 | 1.20 | 1.65 | 1.95 | 2.95 | 5.55 |
| Female Union Tees " " | .60 | .65 | .68 | .86 | 1.05 | 1.45 | 1.75 | 2.55 | 4.80 |

BOILER ELBOW WITH UNION

BOILER COUPLING WITH UNION



Fig. 692E



Fig. 692F BOILER FITTINGS



Fig. 692G



Fig. 692H

| Sizeinches | | Female, Male | Female, Male |
|-------------------------|-----|--------------|--------------|
| Boiler Elbows, Galveach | .40 | .40 | .40 |
| " " with Union, Galv " | .75 | .75 | .60 |
| " Couplings, Galv " | .40 | .40 | .40 |
| " with Union Galy " | 75 | 75 | 60 |



SPECIAL PATTERN

CIRCULATING BOILER TEES Galvanized

3/4 x1/2 x1inches .50 .80 with Union.....

MALLEABLE IRON UNIONS

STANDARD UNION



Fig. 4810A

JEFFERSON UNION



Fig. 4810B

DART UNION



Fig. 4810C

STANDARD UNIONS

| Size inches | 1.8 | 14 | 3/8 | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Price, Black each | .18 | .18 | .20 | .22 | .27 | .33 | .46 | .58 | . 75 | 1.55 | 2.10 | 3.65 | 4.35 |
| " Gal'zed " | .27 | .27 | .30 | .33 | .40 | .50 | .70 | .90 | 1.15 | 2.35 | 3.15 | 5.50 | 6.50 |

JEFFERSON UNIONS

Bronze Seat. Malleable Iron Ball Shoulder

| Sizeinches | 1/8 | 14 | 3/8 | 1/2 | 34 | 1 | 11,4 | 11/2 | 2 | 21/2 | 3 |
|------------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| Price, Blackeach | | | | | | | | | | | |
| " Galvanized " | .45 | .45 | 60 | .75 | .90 | 1.20 | 1.80 | 2.40 | 3.00 | 4.80 | 6.20 |

DART UNIONS

Bronze Seats, Ball Bearings, Ground Joints

| Sizeinches | | | | | | |
|-------------------------------|--|--|--|--|--|--------------|
| Price, Blackeach "Galvanized" | | | | | | 4.80 7.20 |

KEWANEE UNIONS

OCTAGON PATTERN



Fig. 4810D

HEXAGON END



Fig. 4810E

AIR PUMP UNION



Fig. 4810F

OCTAGON OR HEXAGON ENDS

| Sizeinches | 1.8 | 14 | 3/8 | 1/2 | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| Price, Black, ea. | .18 | .19 | .22 | .27 | .40 | .48 | .66 | .80 | 1.14 | 2.10 | 2.65 | 4.30 | 5.50 |
| " Gal'zed " | .22 | .23 | . 26 | .34 | .49 | .60 | .82 | 1.10 | 1.40 | 2.75 | 3.50 | 6.30 | 7.50 |

AIR PUMP UNIONS

| Sizeinches | 11/4×1 | 1½x1¼ | 2x11/2 |
|------------|--------|-------|--------|
| Priceeach | 1.20 | 1.50 | 2.00 |

The Kewanee Union is a combination brass and iron ground ball joint Union. The head piece, or thread end, is of high grade brass, the nut and tail piece of malleable iron.



EXTRA HEAVY

For Steam Working Pressure up to 250 Pounds

ELBOW



UNION CORRUGATED PACE





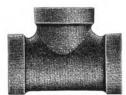


Fig. 4838B



Fig. 4838C

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 |
|-------------------|------|------|------|-------|-------|-------|-------|
| Price Elbowseach | .20 | .25 | .30 | .35 | .40 | .55 | .70 |
| " 45° Elbows " | .25 | .30 | .35 | .42 | .50 | .65 | .85 |
| " Tees | .30 | .40 | .45 | .50 | .60 | .80 | 1.05 |
| " Crosses | .60 | .80 | .90 | 1.00 | 1.20 | 1.60 | 2.10 |
| " Unions, Black " | .20 | .24 | .28 | .35 | .40 | .56 | .80 |
| " " Galvanized" | .24 | .28 | .35 | .46 | .55 | .78 | 1.12 |
| Sizeinches | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 |
| Price Elbow each | .90 | 1.50 | 2.40 | 3.25 | 4.25 | 6.50 | 9.50 |
| " 45° Elbows | 1.10 | 1.85 | 2.85 | 4.00 | 5.00 | 7.50 | 10.50 |
| " Tees | 1.35 | 2.25 | 3.60 | 5.00 | 6.50 | 9.75 | 14.25 |
| " Crosses" | 2.70 | 4.50 | 7.20 | 10.00 | 13.00 | 19.50 | 28.50 |
| " Unions, Black " | .95 | 2.00 | | | | | |
| " Galvanized " | 1.35 | 2.90 | | | | | |

HYDRAULIC

Tested to 2,000 Pounds Pressure per Square Inch

TEE

ELBOW



Fig. 4838D

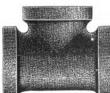


Fig. 4838E

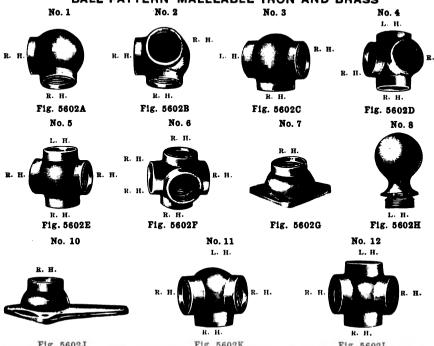
PLANGE UNION



Fig. 4838F

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 |
|---|-------------------------------------|----------------------------------|--------------------------------------|-----------------------------------|-----------------------------------|---------------|------------------------------------|
| Price Elbows each " 45° Elbows " " Tees " Crosses " " Flange Unions " | .20 .25 .30 .60 1.35 | .25 .30 .40 .80 1.35 | .30 .35 .45 .90 1.50 | .35 .42 .50 1.00 1.50 | .40 .50 .60 1.20 1.50 | 2100 | .70 .85 1.05 2.10 2.25 |
| Sizeinches | | 1-10- | 3 | 31/6 | 4 | 5 | 6 |
| Price Elbows each " 45° Elbows " " Tees " " Crosses " | ,90 1,10 1,35 2,70 3,00 | 1.85 2.25 4.50 | 2.40 2.85 3.60 7.20 9.00 | | 5.00 | 9.75 19.50 | $14.25 \\ 28.50$ |

RAILING FITTINGS BALL PATTERN MALLEABLE IRON AND BRASS



| F1g. 56023 | | rig. | 0602 | V | | | | Fig. | 560 | 2L | | |
|----------------------------------|-------|-------|------|------|-------|------|------|-------|------|------|------|------|
| Kind | | M | ALL | EABL | E IRO | N | | Fi | NISH | ер В | RASS | |
| Size inch | nes 1 | 2 3/4 | 1 | 11/4 | 11/2 | 2 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
| No. 1, Elbowea | ch .1 | 5 .18 | .20 | .35 | .45 | .72 | .40 | .60 | .80 | 1.20 | 1.60 | 2.50 |
| " 2, " Side Outlet ' | .20 | 0 .23 | .25 | .40 | .50 | .80 | .75 | 1.00 | 1.10 | 1.70 | 2.00 | 3.00 |
| " 3, Tee | .20 | 0 .23 | .25 | .40 | .50 | .75 | .60 | .85 | 1.10 | 1.70 | 2.00 | 3.00 |
| " 4, " Side Outlet ' | ' .3 | 0 .33 | .35 | .45 | .55 | .90 | 1.05 | 1.25 | 1.50 | 2.00 | 2.40 | 3.50 |
| " 5, Cross ' | .30 | 0 .33 | .35 | .45 | .58 | 1.00 | 1.05 | 1.25 | 1.50 | 2.00 | 2.40 | 3.50 |
| " 6, " Side Outlet ' | .3 | 5 .38 | .40 | .50 | .65 | 1.35 | 1.20 | 1.45 | 1.70 | 2.25 | 3.00 | 4.00 |
| " 7, Floor Flange, Square . ' | .10 | 6 .18 | .20 | .40 | .50 | | | | | | | 2.50 |
| " 8, Ball Ornament ' | | 6 .18 | .20 | .25 | .35 | .90 | | | | | | 2.50 |
| " 10, Floor Flange, Long Base. " | | | .30 | .60 | .75 | 1.25 | | 20.00 | | | 1 | |
| " 11, 45° Ell, Side Outlet ' | | | .50 | .70 | .90 | 1.50 | | 1000 | | | | |
| " 12. 45° Tee " " ' | | | | .75 | 1.00 | | | | | | | |

MALLEABLE REDUCING RAILING FITTINGS

| Reducing | Elbow | 2x1½ | each | .82 |
|----------|-------|---|------|------|
| " | " | 2x1½x1½ Side Outlet | ** | .92 |
| " | Tee | $2x2x1\frac{1}{9}$ or $1\frac{1}{9}x1\frac{1}{9}x2$ | " | .85 |
| 44 | | 2x2x1½x1½ Side Outlet | ** | 1.05 |
| | Cross | $2x2x1\sqrt{2}x1\sqrt{2}$ | 44 | 1.15 |

Order by number and size.

Fittings tapped as above will be furnished unless otherwise specified.

Fittings tapped otherwise than as shown above will be charged at 15 per cent additional net.

Add 50 per cent to list prices for galvanized malleable railing fittings.

٠. 64.

44

..

64.

65.

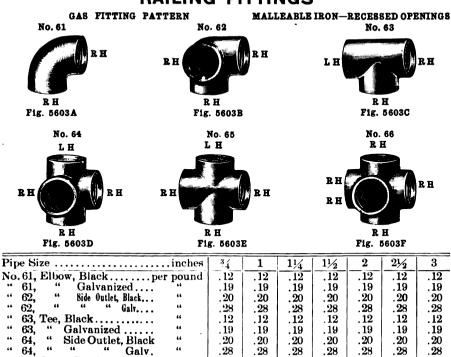
65.

66.

66.

60

RAILING FITTINGS



 $.\mathbf{28}$ Fittings over 2-inch made to order only. Reducing sizes made to order at a special price.

20

28

.20

.28

.20

.20

.28

.20

.28

Fittings will be furnished tapped, as shown in cuts, or right hand on all openings when so specified at regular price, tapped otherwise will be charged at 15 per cent additional net. Fittings can be furnished reamed for slip joints at additional price.

AUXILIARY RAILING FITTINGS

"

"

"

"

"

"

No. 55, LOAFER RAIL

Side Outlet, Black

Galvanized ...

Side Outlet, Black

Cross. Black.....

Galv.

No. 60, SELF CLOSING GATE HINGE

20

 $\overline{28}$

 $.\tilde{12}$

. 19

.20

.28

20

.28

.12

. 19

.20

.28

.20

.28

.12

.19

.20

.28

.20

 $.\overline{28}$

.12

.19

.20

.28

20

.28

. 12

. 19

.20

.28





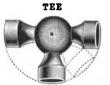
Fig. 5603G Fig. 5603H 1!4 Pipe Sizeinches 1 11/2 2 No. 55 Loafer Rail C. I. 18 inches longeach .30.30 .30.30 60 Self Closing Gate Hingeper pair 4.75 3.00 3.75 Galvanized..... 3.755.00 6.50

Add 50 per cent for galvanized where galvanized prices are not given.

ADJUSTABLE RAILING FITTINGS



Fig. 9131A



CROSS

STAIR TEE

Fig. 9131B

STAIR CROSS

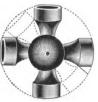


Fig. 9131C





Fig. 9131E

MALLEABLE IRON

| Sizeinc | hes 1 | 11/4 | 11/2 | 2 |
|----------------------|----------|------|------|------|
| Price, Elbowse | ach 1.10 | 1.25 | 1.70 | 2.25 |
| " Tees | | 1.50 | 2.00 | 2.50 |
| " Crosses Stair Tees | | 1.60 | 2.35 | 2.75 |
| " Crosses | " 1.50 | 1.85 | 2.50 | 2.75 |

FINISHED BRASS

| Sizeinches | 1 | 11/4 | 11/2 | 2 |
|----------------|------|------|------|------|
| | 2.75 | 3.15 | 4.25 | 5.65 |
| " Tees " | 3.25 | 3.75 | 5.00 | 6.25 |
| " Crosses" | 3.75 | 4.40 | 5.90 | 6.90 |
| " Stair Tees " | 3.25 | 4.00 | 5.40 | 6.25 |
| " " Crosses | 3.75 | 4.65 | 6.25 | 6.90 |

By means of these Fittings, almost any angle may be obtained in Railings for stairs and other places requiring a deviation from horizontal or perpendicular lines, which would otherwise require special patterns to attain the same results.

STAIR LANDING TEE



Fig. 9131F

STAIR LANDING CROSS



Fig. 9131G

MALLEABLE IRON

| ·Size . | | | | | | . inches | 1 | 114 | 11/2 | 2 |
|---------|-------|---------|------|---------|---------|----------|------|------|------|------|
| Price, | Stair | Landing | Tees | | | each | .90 | 1.10 | 1.50 | 2.15 |
| " | " | | | | | | 1.00 | 1.20 | 1.60 | 2.40 |

45° ANGLE RAILING FITTINGS

No. 1 No. 3 ELBOW ELBOW







Fig. 3640A

Fig. 3640B

Fig. 3640C

Fig. 3640D

Fig. 3640E

| Size. | | | inches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | | | |
|--------|-----|----|-----------------|-----|------|------|------|------|------|--|--|--|
| Price, | No. | 1, | Elboweach | .40 | .70 | .90 | 1.44 | 2.00 | 3.00 | | | |
| 116 | +64 | 2, | " Side Outlet " | .50 | .80 | 1.00 | 1.60 | 2.30 | 3.40 | | | |
| 44 | 44 | 3, | " | .40 | .70 | .90 | 1.44 | 2.00 | 3.00 | | | |
| 44 | 44 | 4, | " Side Outlet " | .50 | .80 | 1.00 | 1.60 | 2.30 | 3.40 | | | |
| 44 | II. | 5, | Tee | .50 | .80 | 1.00 | 1.60 | 2.40 | 3.80 | | | |
| * | ** | 6, | " Side Outlet " | .70 | .90 | 1.10 | 1.80 | 2.80 | 4.30 | | | |
| 46 | 46 | 7. | Cross " | .70 | .90 | 1.16 | 2.00 | 3.00 | 4.50 | | | |
| - 6 | | | " Side Outlet " | .80 | 1.00 | 1.30 | 2.70 | 3.50 | 5.20 | | | |
| - 44 | 66 | 9, | Floor Flange " | .30 | .40 | .56 | .60 | 1.00 | 1.50 | | | |

Angle Railing Fittings, differing from above, at special prices.

FINISHED BRASS

| Size . | | inches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|--------|----|--------------------|------|------|------|------|-------|-------|
| Price, | No | . 1, Elbow each | 1.60 | 2.40 | 3.20 | 5.00 | 8:00 | 14.00 |
| 46 | ** | 2, " Side Outlet " | 2.20 | 3.40 | 4.00 | 6.00 | 12.00 | 17.00 |
| 44 | 44 | 3, " | 1.60 | 2.40 | 3.20 | 5.00 | 8.00 | 14.00 |
| 66 | 66 | 4, " Side Outlet " | 2.20 | 3.40 | 4.00 | 6.00 | 12.00 | 17.00 |
| - 66 | | 5, Tee " | 2.20 | 3.40 | 4.00 | 6.00 | 12.00 | 17.00 |
| 11 | | 6, " Side Outlet " | 3.00 | 4.00 | 4.80 | 7.00 | 14.00 | 20.00 |
| ** | 66 | 7. Cross " | 3.00 | 4.00 | 4.80 | 7.00 | 14.00 | 20.00 |
| 44 | 44 | 8, " Side Outlet " | 3.40 | 4.50 | 6.00 | 8.00 | 16.00 | 23.00 |
| -61 | 44 | 9, Floor Flange " | 1.10 | 1.50 | 2.00 | 2.60 | 4.00 | 6.00 |

Angle Railing Fittings, differing from above, at special prices.

THE "GRIFFIN" FOOT RAIL FITTINGS

CORNER FITTING

FOOT RAIL FITTINGS









Fig. 3640G



| Description | Plain Iron | Bronzed Iron | Galvanized Iron | Artistic Brass |
|---|---------------|-----------------|--------------------|-------------------|
| Price, Corner Fittingseach "Foot Rail Brackets" | .50 | . 75 . 85 | . 75 . 85 | 3.00 3.50 |
| " End Finish Fittings" | .15 | .25 | .25 | 1.40 |

Prices given are for 1-inch sizes.

Foot Rail Brackets are made with heads to carry 1 or $1\frac{1}{4}$ -inch standard pipe. The end and corner fixtures are threaded for both 1 and $1\frac{1}{4}$ -inch as may be required. Prices for $1\frac{1}{4}$ -inch sizes on application.

LIST OF SIZES OF CAST IRON FITTINGS

ELBOWS

| 1/4 x 1/4 8/8 x 3/8 1/4 x 1/4 | 1 x 3/4 1 x 1/2 1 x 3/8 | 1½ x 1½ 1½ x 1¼ 1½ x 1 | 2 x 3/4 21/2 x 21/2 21/2 x 2 | 3½ x 3 4 x 4 4 x 3½ | 5 x 5 5 x 4 5 x 3 | 8 x 8 8 x 7 8 x 6 |
|-------------------------------------|-------------------------------|--|---|---------------------------|-------------------------|-----------------------------|
| 1/2 x 3/8 3/4 x 3/4 3/4 x 1/2 | 1¼ x 1¼ 1¼ x 1 1¼ x 3⁄ | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 4 x3 4 x2½ 4 x2 | 6 x 6 6 x 5 6 x 4 | 9 x 9 10 x 10 12 x 12 |
| 34 x 3/8 1 x 1 | 1¼ x ½ 1¼ x % | $\begin{array}{ccc} 2 & x1\frac{1}{4} \\ 2 & x1 \end{array}$ | 3 x 2 3½ x 3½ | 4½ x 4½ 4½ x 4 | 7 x 7 7 x 6 | |

RIGHT AND LEFT ELBOWS

| | | | | | | | | | - |
|----|-----|----|-----|-----|-----|------|---|------|-----|
| 1. | 3.4 | 1/ | 3/4 | 1 1 | 114 | 1146 | 2 | 21.6 | . 3 |
| 74 | 78 | 72 | 74 | . • | ~/4 | -/2 | _ | | |
| | | · | | | | | | | |

45° ELBOWS

| 3/8 1/2 3/4 1 11 | 11/2 | 2 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 12 |
|------------------|------|--------|---|------|---|------|---|---|---|---|---|---------|
| | | | | | | | | | | | | |

PITCHED ELBOWS

| 3/4 | 1 x % | 1¼ x 1 | 1½ x 1¼ | 2 x 1½ | 21√2 x 2 | 3 x 21/2 | 31∕2 x 3 |
|-----|-------|--------|---------|----------------|----------|----------|----------|
| î | 11/4 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 |

TEES

Tees reducing on the outlet are described thus:

11/2 11/2 11/2 are read 11/2 x1.

Tees reducing on the run are described thus:

1½ 1½ 1½ 1½ 1½ 1½ 1½ 1½ 1.

Tees with both ends of run the same size, with the outlet larger, thus: $\frac{2}{2}$

are known as Bull Head, and are read 1x2.

| 14 x 14 x 14 36 x 36 x 36 12 x 12 x 12 12 x 12 x 36 12 x 36 x 14 12 x 36 x 36 36 x 36 x 36 34 x 34 x 34 34 x 34 x 34 34 x 34 x 36 34 x 34 x 36 | 1 x1 x1 1 x1 x 34 1 x1 x 1/2 1 x1 x 3/8 1 x1 x 1/4 1 x 3/4 x1 1 x 3/4 x 3/4 1 x 3/4 x 1/2 1 x 1/2 x 1/4 | 1¼x1¼x1¼ 1¼x1¼x3 1¼x1¼x¾ 1¼x1¼x½ 1¼x1 x1¼ 1¼x1 x1 1¼x1 x ¾ 1¼x1 x ½ 1¼x1 x ½ 1¼x3 ¾x1¼ 1¼x3 ¾x1¼ | 1½x1½x1½ 1½x1½x1¼ 1½x1½x1 1½x1½x3 1½x1½x ¾ 1½x1½x ½ 1½x1½x1½ 1½x1½x1½ 1½x1¼x1¼ 1½x1¼x1 1½x1¼x1 1½x1¼x3 1½x1¼x ¾ 1½x1¼x ½ | 1½x ¾x1½ 1½x ¾x1 1½x ¾x 1½x ¾x 1½x1½x1½ 1½x ½x1½ 1½x ½x1¼ 1¼x1¼x1½ 1¼x1 x1½ 1¼x ¾x1½ 1¼x ½x1½ 1¼x ½x1½ 1 x1 x1½ | 2 2 2 2 2 2 2 2 | x2 x 34 x2 x 1/2 x2 x1/2 x1/2 x1 x1/2 x1/2 x1 x1/2 x1 x1/2 x 34 x1/2 x 1/2 x1/4 x2 x1/4 x2 x1/4 x1/2 |
|--|---|--|---|---|--------------------------------------|---|
| · · · · · · · · · | / - . | | | 1 /4 /4 /4 | 2 2 2 2 2 2 2 2 | x1½x1½ x1½x1¼ x1½x1 x1½x 3½ x1x 2 x1 x1½ x1 x1½ |

LIST OF SIZES

CAST IRON FITTINGS

TEES

| 2 x1 x1 | 1½x1½x2½ | 3½x2½x3½ | 4 x2 x4 | 5 | x2½x5 | 8x 8x 7 |
|--|--|--------------------------------|--|--------|------------------------|---|
| 2 x1 x 3/4 | 3 x3 x3 | 3½x2½x3 | 4 x2 x3 | 5 | x21/4 x4 | 8x 8x 6 |
| 2 x 3/4 x2 | 3 x3 x2½ | 3½ x2½ x2½ | 4 x2 x2½ | 5 | x2½x3 | 8x 8x 5 |
| 2 x 3/4 x 1 ½ | 3 x3 x2 | 31/4 x21/4 x2 | 4 x2 x2 | 5 | x2 x5 | 8x 8x 4 |
| $2 \times \frac{1}{2} \times 2$ | 3 x3 x1½ | 3 x3 x3½ | 4 x1½x4 | 4 | x4 x 5 | 8x 8x 31/4 |
| 11/2 x 11/2 x 2 | $3 \times 3 \times 1\frac{1}{4}$ | 31/4 x2 x31/2 | 4 x11/4x4 | 6 | x6 x6 | 8x 8x 3 |
| $1\frac{1}{2}x1\frac{1}{4}x2$ | 3 x3 x1 | 3½x1½x3½ | 4 x1 x4 | 6 | x6 x5 | 8x 8x 21/2 |
| 1½ x1 x2 | 3 x3 x 3/4 | 3½x1½x3½ | 31/4 x31/4 x4 | 6 | x6 x41/4 | 8x 8x 2 |
| 1½x ¾x2 | 3 x2½x3 | 3½x1 x3½ | 3 x3 x4 | 6 | x6 x4 | 8x 7x 8 |
| $1\frac{1}{4}x1\frac{1}{4}x2$ | 3 x2½x2½ | 4 x4 x4 | 21/2 x21/2 x4 | 6 | x6 x3½ | 8x 7x 6 |
| $1\frac{1}{4} \times 1 \times 2$ | 3 x2½x2 | 4 x4 x31/2 | 4½ x4½ x4½ | 6 | x6 x3 | 8x 6x 8 |
| $1\frac{1}{4}$ x $\frac{3}{4}$ x2 | 3 x2½x1½ | 4 x4 x3 | $4\frac{1}{2} \times 4\frac{1}{2} \times 4$ | 6 | x6 x2½ | 8x 6x 7 |
| 1 x1 x2 | 3 x2½x1¼ | 4 x4 x2½ | 4½ x4½ x3½ | 6 | x6 x2 | 8x 6x 6 |
| $1 \times \frac{3}{4} \times 2$ | 3 x2½x1 | 4 x4 x2 | 41/2 x 41/2 x 3 | 6 | x6 x1½ | 8x 5x 8 |
| 3/4 x 3/4 x2 | 3 x2 x3 | 4 x4 x1½ | 4½x4½x2½ | 6 | x6 x1½ | 8x 5x 5 |
| $2\frac{1}{2}$ x $2\frac{1}{2}$ x $2\frac{1}{2}$ | 3 x2 x2½ | 4 x4 x11/4 | 4½x4½x2 | 6 | x6 x1 | 8x 4x 8 |
| $2\frac{1}{2}$ x $2\frac{1}{2}$ x 2 | 3 x2 x2 | 4 x4 x1 | 4½x4½x1½ | 6 | x5 x6 | 6x 6x 8 |
| 2½x2½x1½ | $3 x^2 x^{1\frac{1}{2}}$ | 4 x4 x 3/4 | 4½x4½x1¼ | 6 | x5 x5 | 9x 9x 9 |
| 2½x2½x1¼ | $3 \times 2 \times 1\frac{1}{4}$ | 4 x3½x4 | 5 x5 x5 | 6 | x5 x4 | 9x 9x 7 |
| 2½x2½x1 | 3 x2 x1 | $4 x3\frac{1}{2}x3\frac{1}{2}$ | $5 \times 5 \times 4\frac{1}{2}$ | 6 | x4 x6 | 9x 9x 6 |
| 2½x2½x ¾ | 3 x1½x3 | 4 x3½x3 | 5 x5 x4 | 6 | x4 x4 | 9x 9x 5 |
| $2\frac{1}{2}$ x $2\frac{1}{2}$ x $\frac{1}{2}$ | $3 x1\frac{1}{2}x2\frac{1}{2}$ | 4 x3½x2½ | $5 \times 5 \times 3\frac{1}{2}$ | 6 | x 3 x 6 | 10x10x10 |
| $2\frac{1}{2}$ x2 x2\forall | 3 x1½x2 | 4 x3½x2 | 5 x5 x3 | 6 | x 2½ x 6 | 10x10x 8 |
| 2½x2 x2 | $3 x1\frac{1}{4}x3$ | 4 x3½x1½ | $5 	ext{ x} 5 	ext{ x} 2\frac{1}{2}$ | 6 | x 2 x 6 | 10x10x 6 |
| $2\frac{1}{2}$ x2 x1\frac{1}{2} | 3 x1 x3 | 4 x3½x1¼ | 5 x5 x2 | 5 | x5 x6 | 10x10x 5 |
| 2½x2 x1¼ | 2½x2½x3 | 4 x3 x4 | $5 \times 5 \times 1\frac{1}{2}$ | 4 | x4 x6 | 10x10x 4 |
| 2½x2 x1 | 2½x2 x3 | $\frac{4}{3}$ $\frac{3}{2}$ | $5 x5 x1\frac{1}{4}$ | 7 | x7 x7 | 10x10x 3 |
| 2½ x2 x ¾ | 2 x2 x3 | 4 x3 x3 | 5 x5 x1 | 7 | x7 x6 | 10x 8x 8 |
| $2\frac{1}{2}$ x2 x $\frac{1}{2}$ | 3½ x3½ x3½ | 4 x3 x2½ | 5 x4 x5 | 7 | x7 x5 | 12x12x12 |
| $2\frac{1}{2}$ x $1\frac{1}{2}$ x $2\frac{1}{2}$ | 3½x3½x3 | 4 x3 x2 | $5 x4 x4\frac{1}{2}$ | 7 | x7 x4 | 12x12x10 |
| 2½x1½x2 | 3½x3½x2½ | 4 x3 x1½ | 5 x4 x4 | 7 | x7 x3½ | 12x12x 8 |
| 2½x1½x1½ | 3½x3½x2 | 4 x3 x1½ | 5 x4 x3 | 7 | x7 x3 | 12x12x 6 |
| 2½x1½x1¼ | $3\frac{1}{2}x3\frac{1}{2}x1\frac{1}{2}$ | 4 x3 x1 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 7 | x7 x2½ | 12x12x 5 |
| 2½x1½x1 | $3\frac{1}{2}$ x $3\frac{1}{2}$ x $1\frac{1}{4}$ | 4 x3 x 34 | 5 x4 x2 | 7 | x7 x2 | 12x12x 4 |
| 2½ x1¼ x2½ | $3\frac{1}{2}$ x $3\frac{1}{2}$ x 1 | 4 x2½x4 | 5 x3 x5 | 7 | x6 x7 | 12x 8x10 |
| 2½x1¼x2 | 3½x3 ₹3½ | 4 x2½x3 | 5 x3 x1½ | 7 | x6 x6 | 12x 8x 8 |
| 2½x1¼x1½ | 3½x3 x3 | 4 x2½x2½ | 5 x3 x4 | 7 | x6 x5 | • |
| 2½x1 x2½ | $3\frac{1}{2}$ x3 x2\frac{1}{2} | 4 x2½x2 | $\frac{5}{5}$ x3 x3\frac{1}{2} | 7 | x5 x 6 | • |
| 2½x ¾x2½ | 3½x3 x2 | 4 x2½x1½ | 5 x3 x3 | 7 | x5 x5 | • |
| 2 x2 x2½ | 3½x3 x1½ | 4 x2½x1¼ | $ \begin{array}{ccccccccccccccccccccccccccccccccccc$ | 6 8 | x6 x7 | |
| 2 x1½x2½ | 3½x3 x1¼ | 4 x2½x1 | o xo xz | 8 | x8 x8 | |

LIST OF SIZES OF

CAST IRON FITTINGS

CROSSES

| 1/4 x 1/4 x 1/4 | 2½ x 2½ x 1 2½ x 2½ x 3 2½ x 2 x 1½ 3 x 3 x 3 3 x 3 x 2½ 3 x 3 x 1½ 3 x 3½ x 3½ 3½ x 3½ x 3½ 3½ x 3½ x 2 3½ x 3½ x 2 3½ x 3½ x 2 4 x 4 x 4 4 x 4 x 4 4 x 4 x 1½ 4 x 4 x 1½ | 5 x 5 x 4 5 x 5 x 3 5 x 5 x 2 6 x 6 x 5 6 x 6 x 4 6 x 6 x 3 6 x 6 x 2 7 x 7 x 7 7 x 7 x 5 8 x 8 x 7 8 x 8 x 6 8 x 8 x 5 8 x 8 x 8 8 x 8 x 5 8 x 8 x 8 x 5 |
|---|--|--|
| 3/ x 3/ x 3/ | 2½ x 2½ x ¾ | 5 x 5 x 3 |
| 92 x 32 x 12 | $2\frac{1}{4} \times 2^{2} \times 1\frac{1}{4}$ | 5 x 5 x 21/2 |
| 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 1 7 | 3 x 3 x 3 x | 5 x 5 x 2 |
| 1 71 7 3/ | 3 73 7214 | 6 - 6 - 8 |
| 1 1 22 | 3 73 77 | 6 x 6 x 6 |
| 1 X 1 · X 72 | 9 -9 -11/ | 6 x 6 x 9 |
| 14 X 14 X 14 | 3 X3 X172 | 6 x 6 x 4 |
| 14 x 14 x 1 | 3 X 3 X 1/4 | 6 x 6 x 3 |
| 1¼ x 1¼ x ¾ | 3 x3 x1 | 6 x 6 x 2½ |
| 1½ x 1½ x ½ | 3 x 3 x ¾ | 6 x 6 x 2 |
| 1½ x 1½ x 1½ | 3½ x 3½ x 3½ | 6 x 6 x 5 6 x 6 x 4 6 x 6 x 3 6 x 6 x 2½ 6 x 7 x 7 |
| 11/2 x 11/2 x 11/2 | 3½ x 3½ x 3 | 7 x 7 x 6 |
| 1¼ x 1¼ x 1 | $3\frac{1}{2} \times 3\frac{1}{2} \times 2\frac{1}{2}$ | 7 x 7 x 5 |
| 11/ v 11/ v 3/ | 3½ x 3½ x 2 | 5 x 5 x 2 6 x 6 x 6 6 x 6 x 5 6 x 6 x 3 6 x 6 x 2 6 x 6 x 2 7 x 7 x 7 7 x 7 x 6 7 x 7 x 5 8 x 8 x 8 8 x 8 x 5 8 x 8 x 5 8 x 8 x 5 8 x 8 x 5 8 x 8 x 2 9 x 9 x 9 10 x 10 x 10 |
| 11/ + 11/ + 1/ | 314 x 314 x 114 | 8 7 8 7 7 |
| 172 172 172 172 | A V A V A | |
| 172 x 174 x 1 | 4 - 4 - 21/ | 0 4 0 4 0 |
| 2 x 2 x 2 | 4 X 4 X 372 | |
| 2 x 2 x 1 1/2 | 4 X4 X3 | |
| $2 \times 2 \times 1\frac{1}{4}$ | 4 x 4 x 2½ | 9 x 9 x 9 |
| $2 \times 2 \times 1$ | 4 x 4 x 2 | 10 x 10 x 10 |
| $2 \times 2 \times \frac{3}{4}$ | 4 x 4 x 1½ | 10 x 10 x 8 10 x 10 x 7 |
| 2½ x 2½ x 2½ | 4 x 4 x 1½ | 10 x 10 x 7 |
| $2i\tilde{\chi} \times 2i\tilde{\chi} \times 2\tilde{\chi}$ | 4 x 4 x 1 | 10 x 10 x 7 12 x 12 x 12 |
| $2\frac{1}{2}$ x $2\frac{1}{2}$ x $1\frac{1}{2}$ | 41% x 41% x 41% | 12 x 12 x 10 |
| | 5 x 5 x 5 | 12 x 12 x 8 |
| -/8/8/4 | ! | L |

REDUCERS

| | x 4 x 8 x 6 x 10 |
|--|---------------------------|
|--|---------------------------|

ECCENTRIC REDUCERS

| | 0 114 | 0 01/ | 01.4.0 | F - 0 | 5-4 | 6 - 4 |
|---------------------------------|------------------------------------|------------------------------------|-------------------------|----------|----------|-------|
| 1¼ x ¾ | 2 x 1½ | 3 x 2½ | 3½ x 3 | 5 x 2 | 5 x 4 | 6 x 4 |
| 1½ x 1 | $2\frac{1}{2} \times 1\frac{1}{2}$ | $3\frac{1}{4} \times 1\frac{1}{4}$ | $4 \times 2\frac{1}{2}$ | 5 x 23/4 | 6 x 21/2 | 6 x 5 |
| $1\frac{1}{2}$ x $1\frac{1}{4}$ | 2½ x 2 | 3½ x 2 * | 4 x 3 2 | 5 x 3 ~ | 6 x 3 | 8 x 5 |
| 2^{2} x $1\frac{1}{4}$ | 3 x 2 | 31/2 x 21/2 | 4 x 3½ | 5 x 31/4 | 6 x 31/2 | |

CAPS

| 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
|---|--|---|---|---|---|---|----|----|
| | <u>' </u> | | | | | · | | |

PLUGS

| 1/8 1/4 3/8 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 3½ | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
|-----------------|----|---|------|------|---|------|---|----|---|------|---|---|---|---|---|----|----|
| | | | | | | | | | | | | | | | | | |

LOCKNUTS

| | | | | | | | | | | |
|---------|-----|-----|-----|------|---|-----|-----|-------|----|------|
| () () |) | 01/ | | 41/ | - | | 7 | 0 | 10 | l 19 |
| 2 24 | - 3 | 3-6 | 4 | 41/6 | Ð | ס ו | | 0 | TO | 12 |
| ~ 1 ~/3 | • | U/2 | - 1 | -/2 | - | 1 - | l . | | | 1 |
| | | | | | | | | | | |

LIST OF SIZES OF

CAST IRON FITTINGS

BUSHINGS

| | | · | |
|-----------------------------------|------------------------------------|-------------------------|-------------|
| 3'8 x 1/8 | 21∕2 x 1 | 4½ x 2½ | 7 x 5 |
| 1/2 x 1/4 | $2\frac{1}{2} \times 1\frac{1}{4}$ | 4½ x 3 | 7 x 6 |
| 34 x 14 | $2\frac{1}{2} \times 1\frac{1}{2}$ | 4½ x 3½ | 8 x 2 |
| 34 x 3/8 | $3 \times \frac{3}{4}$ | 4½ x 4 | 8 x 2½ |
| 1 x ½ | 3 x 1 | 5 x 2 | 8 x 3 |
| 1 x 3/8 | 3 x 1½ | 5 x 2½ | 8 x 4 |
| $1 \times \frac{1}{2}$ | $3 \times 1\frac{1}{2}$ | 5 x 3 | 8 x 5 |
| 114 x 1/4 | 3 x 2 | 5 x 3½ | 8 x 6 |
| 1½ x 3/8 | 3 x $2\frac{1}{2}$ | 5 x 4 | 8 x 7 |
| $1\frac{1}{4} \times \frac{1}{2}$ | 3½ x 1 | $5 \times 4\frac{1}{2}$ | 9 x 6 |
| 11/4 x 3/4 | $3\frac{1}{2} \times 1\frac{1}{4}$ | 6 x 2 | 9 x 7 |
| 1½ x ¼ | $3\frac{1}{2} \times 1\frac{1}{2}$ | 6 x 2½ | 9 x 8 |
| 1½ x 3/8 | $3\frac{1}{2} \times 2$ | 6 x 3 | 10 x 4 |
| 1½ x ½ | $3\frac{1}{2} \times 2\frac{1}{2}$ | 6 x 3½ | 10 x 5 |
| 1½ x ¾ | 3½ x 3 | 6 x 4 | 10 x 6 |
| 1½ x 1 | 4 x 1 | 6 x 4½ | 10 x 7 |
| 2 x 1/4 | 4 x 1½ | 6 x 5 | 10 x 8 |
| 2 x 3/8 | $4 \times 1\frac{1}{2}$ | 7 x 2 | 12 x 6 |
| $2 \times \frac{1}{2}$ | 4 x 2 | 7 x 2½ | 12 x 8 |
| 2 x 3/4 | $4 \times 2\frac{1}{2}$ | 7 x 3 | 12 x 10 |
| 2 x 1 | 4 x 3 | $7 \times 3\frac{1}{2}$ | |
| 2 x 11/4 | 4 x 3½ | 7 x 4 | |
| 2½ x ¾ | 4½ x 2 | $7 \times 4\frac{1}{2}$ | • |

Bushings reducing one size only up to 21/2 inches inclusive, not shown in above list, are made of Malleable Iron.

LONG SWEEP FITTINGS

| Elbows | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
|----------------------|---|------|------|---|------|---|------|---|-------|---|---|---|---|---|----|----|
| Double Branch Elbows | 1 | 11/4 | | | | | | | | | 6 | 7 | 8 | 9 | 10 | 12 |
| Tees | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Crosses | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | • • • | 5 | 6 | 7 | 8 | 9 | 10 | 12 |

STRAIGHT BACK TEES

| 1 x 1 x 1 | 3 x 3 x 1½ | 5 x 5 x 3 | 7 x 7 x 7 |
|--|--------------------|------------|--------------|
| 1¼ x 1¼ x 1¼ | 31/2 x 31/2 x 31/2 | 4 x 4 x 5 | 8 x 8 x 8 |
| 11/2 x 11/2 x 11/2 | 4 x 4 x 4 | 4 x 3½ x 5 | 8 x 8 x 6 |
| $2 \times 2 \times 2$ | 4 x 4 x 2½ | 6 x 6 x 6 | 9 x 9 x 9 |
| $2\frac{1}{2} \times 2\frac{1}{2} \times 2\frac{1}{2}$ | 3½ x 3 x 4 | 6 x 6 x 4 | 10 x 10 x 10 |
| $2\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$ | 41/2 x 41/2 x 41/2 | 4 x 5 x 6 | 12 x 12 x 12 |
| 3 x 3 x 3 | 5 x 5 x 5 | 4 x 4 x 6 | |

ELBOWS

STRAIGHT



Fig. 3994A

Fig. 3994B

450



Fig. 3994C

STRAIGHT SIZES

| Sizeinches | 14 | 3/8 | 1.4 | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 |
|---------------------------|--------------|----------------|----------------|--------------|---|--------------|---------------|---|---|-------------|
| Price, Blackeach "Galv" | .05 | .05 | .06 .12 | .08 | $\begin{array}{c} .10^{1} _{2} \\ .21 \end{array}$ | .16 .32 | .20 .40 | .28 .56 | .50 1.00 | .75 1.50 |
| Sizeinches | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Price, Black each "Galv " | 1.05 2.10 | $1.20 \\ 2.40$ | $1.75 \\ 3.50$ | 2.00 4.00 | $\begin{array}{c} 2.75 \\ 5.50 \end{array}$ | 4.70 9.40 | 6.75 13.50 | $\begin{array}{c} \overline{9.00} \\ 18.00 \end{array}$ | $\begin{array}{c} 13.50 \\ 27.00 \end{array}$ | |

REDUCING

| Sizeinches Price, Blackeach | .07 | $-{}^{3}_{.09}^{4}$ | .12 | .18 | $-\frac{1\frac{1}{2}}{.23}$ | $\frac{2}{.32}$ | $-\frac{2\frac{1}{2}}{.60}$ | | $\begin{array}{ c c c }\hline 3\frac{1}{2}\\\hline 1.20\\\hline \end{array}$ |
|-----------------------------|---------------------|---------------------|-----------------|---|-----------------------------|-----------------|-----------------------------|----------------|--|
| " Galv " Sizeinches | 14 | .18 | $\frac{.24}{5}$ | 36 6 | .46_ 7 | .64 | 9 | 1.70 | 12 |
| Price, Blackeach "Galv" | $\frac{1.40}{2.80}$ | 2.00 4.00 | 2.30 4.60 | $\begin{array}{c} 3.15 \\ 6.30 \end{array}$ | 5.40 10.80 | 7.75 15.50 | $10.50 \\ 21.00$ | 15.50 31.00 | $\begin{array}{c} 23.00 \\ 46.00 \end{array}$ |

RIGHT AND LEFT

| Sizeinches | 1/4 | 3/8 | 1,2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|-------------------|-----|-----|------|-----|-----|------|------|-----|------|-----|
| Price, Black each | .06 | .06 | . 07 | .09 | .12 | .18 | 23 | .32 | - 60 | .85 |

The ribs on the band of right and left elbows denote the left-hand thread.

45°

| Sizeinches | 3.8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 |
|---------------------------|---------------------|--------------|---------------------|---|---------------|------|------------------|-------------|-------------|---------------------|
| Price, Black each "Galv " | .06 | .07 .14 | .10 .20 | $\begin{array}{c c} -12 \\ -24 \end{array}$ | .19 | .24 | .34 | .60 1.20 | .90 1.80 | $\frac{1.25}{2.50}$ |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | |
| Price, Black each "Galv " | $\frac{1.45}{2.90}$ | 2.20 4.40 | $\frac{2.50}{5.00}$ | 3.45 6.90 | 5.90 11.80 | | $11.25 \\ 22.50$ | | | |

22½°

| Sizeinches | 1 | 114 | 11/2 | 2 |
|------------------|-----|------|------|-----|
| Price, Blackeach | .35 | . 45 | .50 | .60 |

PITCHED

| Size inches | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------|------|------|-----|------|------|------|------|------|------|
| Price, Black each | . 10 | . 13 | 20 | .25 | . 35 | . 65 | 1.00 | 1.30 | 1.50 |

TEE



Fig. 3995A

CROSS



Fig. 3995B

"Y" BRANCH



Fig. 3995C

| | LES Straight Sizes | | | | | | | | | | | | |
|---------------------------|--------------------|--------------|------|--------------|------------|---------------|-----------------|-----------------------|----------------|---------------------|--|--|--|
| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | | | |
| Priceeach Galvanized " | .08 | .08 .16 | .09 | .12 .24 | .15 .30 | .23 .46 | .29 | .41 | .73 1.46 | $\frac{1.10}{2.20}$ | | | |
| Sizeinches | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | | | |
| Priceeach Galvanized " | | 1.75 3.50 | | 3.00 6.00 | | 6.80 13.60 | $9.75 \\ 19.50$ | $\frac{13.00}{26.00}$ | 19.50 39.00 | 29.00 58.00 | | | |

| HEDOCING TEES | | | | | | | | | | | | |
|--------------------------|--------------|---------------------|--------------|--------------|---------------|-----------------------|----------------|-----------------------|----------------|--|--|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | | | |
| Priceeach Galvanized | .10 | .14 | | .27 .54 | | .47 .94 | .83 1.66 | | | | | |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | | | |
| Priceeach Galvanized" | 2.00 4.00 | $\frac{2.95}{5.90}$ | 3.50 7.00 | 4.60 9.20 | 7.80 15.60 | $\frac{11.25}{22.50}$ | 15.00 30.00 | $\frac{22.50}{45.00}$ | 33.50 67.00 | | | |

| | CHOSSES | | | | | | | | | | | |
|------------------------------|--------------|--------------|---------------|-----------------|----------------|----------------|----------------|----------------|-----------------|--|--|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | | | |
| Crosseseach Galvanized" | .16 .32 | .22 .44 | .27 .54 | .42 .84 | .53 1.06 | .75 1.50 | 1.30 2.60 | 2.00 4.00 | 2.70 5.40 | | | |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | | | |
| Crosses each Galvanized " | 3.15 6.30 | 4.60 9.20 | 5.50 11.00 | $7.25 \\ 14.50$ | 12.25 24.50 | 17.50 35.00 | 23.50 47.00 | 35.00 70.00 | 52.50 105.00 | | | |

| REDUCING CROSSES | | | | | | | | | | | |
|----------------------------|------------|------|----------------------|------|------|-------------|--------------|----|------|--|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | | |
| Crosses each Galvanized | .18 .36 | | | | | .83 1.66 | 1.45 2.90 | | | | |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | | |
| Crosseseach Galvanized" | | | $\frac{6.00}{12.00}$ | | | | | | | | |
| | | | | | | | | | | | |

| | "Y" BRANCHES | | | | | | | | | | | | |
|--------------------------------|--------------|---------------|---------------|---------------|----------------|----------------|----------------|-----------------|--------------|--|--|--|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | | | | |
| "Y" Branches each Galvanized " | .20 .40 | | .34 | 1.08 | .66 1.32 | .94 1.88 | 1.66 3.32 | 2.50 5.00 | 3.50 7.00 | | | | |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 10 | 12 | | | | | |
| "Y" Brancheseach Galvanized | 4.00 8.00 | 5.90 11.80 | 7.00 14.00 | 9.20 18.40 | 15.60 31.20 | 22.50 45.00 | 45.00 90.00 | 67.00 134.00 | | | | | |

CLOSE PATTERN

RETURN BENDS









Fig. 3998B

| F1g. 3998A | 1 | L18. 2330D | | | | | | | |
|--|-----|------------|---------------------|-------------------|------|------------|--------------|--------------|---------------|
| Size inches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 4 |
| R. H. Black each "Galvanized " | .18 | .20 | .22 | .28 | .40 | .57 | 1.20 2.40 | 1.70 3.40 | 5.00 10.00 |
| R. & L. Black | .21 | .23 | .26 | .33 | .46 | .66 .66 | 1.40 | 1.95 1.95 | 5.25 5.25 |
| R. H. Pitched Black " R. & L. Pitched" | | | .26 .26 | .33 | | | | 1.30 | |
| Center to Centerinches | 114 | $ i_{12}$ | $1^{\frac{20}{34}}$ | $\frac{.33}{214}$ | 21/2 | 31/4 | 334 | 41/4 | 6 |

BACK OUTLET

| Sizeinches | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|---|------|-----|-----------------|------|------|------|------|
| Right Hand, Blackeach " " Galvanized. " Right and Left, Black" Center to Centerinches | .38 | .42 | .60 | .80 | 1.15 | 2.00 | 3.00 |
| | .76 | .84 | 1.20 | 1.60 | 2.30 | 4.00 | 6.00 |
| | .42 | .48 | .70 | .95 | 1.30 | 2.30 | 3.50 |
| | 17/8 | 214 | 21 ₄ | 2½ | 3¼ | 334 | 41/4 |

OPEN PATTERN





Fig. 3998C



F1g. 3998D

| O'LIV TATTETIT | | | | | | | | | | | | |
|--------------------------------|-----|----|-----|------|-------------|---------------------|--------------|---------------|--|--|--|--|
| Sizeinches | 34 | 1 | 1!4 | 11/2 | 2 | 21/2 | 3 | 4 | | | | |
| R. H. Black each "Galvanized " | .26 | | .40 | .55 | .80 1.60 | $\frac{1.35}{2.70}$ | 2.20 4.40 | 6.50 10.00 | | | | |
| R. & L. Black | 30 | 35 | .46 | .64 | .92 | 1.55 | 2.50 | ١ | | | | |

DEN PATTERN

| | | | | TT | | |
|--|--|--|--|----|--|--|
| | | | | | | |

| Sizeinches | 1 | 1 | 1 | 1 | 1 | 11/4 | 11/4 | 11/2 |
|------------------------|------|------|------|------|------|------|-------|----------|
| Blackeach | .45 | .50 | .60 | . 75 | 1.00 | 1.00 | 1.25 | 1.30 |
| Galvanized " | .80 | .90 | 1.10 | 1.30 | 1.60 | 1.75 | 2.00 | 2.30 |
| Center to Centerinches | 3 | 4 | 5_ | 6_ | 8 | 4 | 6 | 47/8 |
| Sizeinches | 11/2 | 11/2 | 2 | 2 | 2 | 2 | 4 | |
| Blackeach | 1.60 | 2.00 | 1.75 | 2.00 | 3.00 | 3.50 | 7.50 | |
| Galvanized " | 2.60 | 3.25 | 3.00 | 3.25 | 4.50 | 5.00 | 11.00 | |
| Center to Centerinches | 6 | 8 | 47% | 6 | 7 | 8 | 11 | . |

Return Bends not listed will be furnished at special net prices.

CAP



Fig. 3997A

BUSHING



Fig. 3997C

PLUG



Fig. 3997D

LOCKNUT



Fig. 3997B COUNTERSUNK PLUG



Fig. 3997E

CAPS

| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
|------------|------|------|------|------|------|------|------|-------|-------|
| Priceeach | .87 | 1.05 | 1.20 | 1.55 | 2.50 | 2.85 | 4.75 | 5.50 | 7.00 |
| Galvanized | 1.74 | 2.10 | 2.40 | 3.10 | 5.00 | 5.70 | 9.50 | 11.00 | 14.00 |

LOCKNUTS

| Sizeinches | | | | | | | | | | | | |
|-------------------------|-----|-----|-----|------|------|------|------|------|------|------|------|------|
| Price each Galvanized " | .27 | .34 | .47 | .64 | .85 | .90 | 1.30 | 1.70 | 2.35 | 2.70 | 3.00 | 4.00 |
| | .54 | .68 | .94 | 1.28 | 1.70 | 1.80 | 2.60 | 3.40 | 4.70 | 5.40 | 6.00 | 8.00 |

BUSHINGS

| Sizeinches | 3/8 | 1/2 | 3⁄4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 |
|----------------------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|---------------|------|
| Priceeach Galvanized " | .04 .08 | .04 | .05 | .06 | .07 .14 | .09 | .14 | .21 .42 | .30 | .40 |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | |
| Price each Galvanized " | .50 1.00 | .75 1.50 | .93 1.85 | 1.25 2.50 | 1.87 3.75 | 2.75 5.50 | 3.25 6.50 | 3.75 7.50 | 5.00 10.00 | •••• |

PLUGS

| Size inches | 1/8 | 1/4 | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 |
|----------------------|------------|------------|-------------|-------------|----------------|--------------|--------------|--------------|--------------|---------------|------------|
| Priceeach Galv " | .02 | .02 .04 | .02 .04 | .02 .04 | .03 .06 | .04 .08 | .05 .10 | .07 .14 | .10 .20 | .18 .36 | .25 .50 |
| Size inches | 31/2 | 4 | 4 1/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | |
| Price each Galv " | .38 .76 | .42 .84 | .65 1.30 | .88 1.75 | $1.20 \\ 2.40$ | 1.85 3.70 | 2.75 5.50 | 3.25 6.50 | 3.75 7.50 | 5.00 10.00 | •••• |

SPECIAL PLUGS

| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|-------------------|-----|-----|-------|-----|-----|------------|-----------|-----------|-------|---------|---------|------|------|------|---------|
| Countersunk. each | | | .04 | .06 | .08 | .09 | .11 | .15 | .30 | .40 | .92 | 1.10 | | 2.00 | 3.50 |
| Left Hand " | | ••• | • • • | .06 | .08 | .09 .09 | .11 25 | .15 30 | • • • | • • • • | • • • • | | | •••• | • • • • |
| Solid | .04 | .04 | .04 | .06 | .08 | .09 | .11 | .15 | .27 | .38 | .57 | .63 | 1.00 | 1.35 | 1.80 |

REDUCER



Fig. 4812A

ECCENTRIC REDUCER



Fig. 4812B

REDUCERS

| Sizeinches | | | | | | | | |
|------------------|------|------|------|-------|-------|---------------|-------|-------|
| Price, Blackeach | 1.85 | 2.00 | 2.70 | 5.35 | 6.75 | 8.35 | 10.00 | 15.00 |
| " Galvanized " | 3.70 | 4.00 | 5.40 | 10.70 | 13.50 | 16.7 0 | 20.00 | 30.00 |

ECCENTRIC REDUCERS

| Sizeinches | 11/4 | 1½ | 2 | 21/2 | 3 | 3½ | 4 | 5 | 6 | 8 |
|------------------|------|-----|------|------|------|------|------|------|------|-------|
| Price, Blackeach | .55 | .72 | 1.00 | 1.50 | 2.40 | 3.00 | 4.00 | 6.00 | 8.00 | 11.00 |

ECCENTRIC ON RUN

ECCENTRIC FITTINGS ECCENTRIC ON OUTLET



Fig. 4812C Fig. 4812D





Fig. 4812E

Eccentric fittings are designed to prevent the accumulation and lodgement of

Order must be accompanied with sketch, showing position in which the fitting is to be placed

BLOW-OFF CROSS



Fig. 4812F

| Size inches | $2\frac{1}{2}$ x $1\frac{1}{2}$ | $3x1\frac{1}{2}$ | 3x2 | 4x2 | 4x2½ | 5x2½ | 5x3 | 6x2½ | 6x3 |
|-------------|---------------------------------|------------------|-------|-------|-------|-------|-------|-------|-------|
| Blackeach | 9.00 | 10.00 | 10.00 | 12.00 | 12.00 | 18.00 | 18.00 | 27.00 | 27.00 |

The utility and convenience of this special fitting for feeding and blowing off boilers will recommend its use on all first-class steam plants.

BRANCH TEES

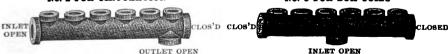
No. 1 FOR CIRCULATION



No. 2 FOR CIRCULATION

Fig. 21A

No. 8 FOR BOX COILS



Pig. 21B

Pig. 21C

| | | 1 Inch | | | 1¼ Inci | 1 | | 1½ Ince | | | 2 Inch | |
|-----------------------|------------|-------------------|--------|-------------|--------------------|--------|-----------|----------------------|-------------|--------|-------------------|-----------|
| Number of Branches | 21/4 11 | nch Cen Center | ter to | 3 in | ch Cente Center | er to | 3½ i | nch Center Center | er to | 41/4 1 | nch Cen Center | ter to |
| um Iran | | | | | Sta | E OF R | un, Inc | HES | | | | |
| Z | 1 or 1% | 11/4 | 2 | 1½ or 1½ | 2 | 21/4 | 1½ or | 21/4 | 3 | 2 | 2¼ or | 81/4 |
| 2 | .90 | 1.00 | 1.15 | | | | | | | | | |
| 3 | 1.05 | 1.15 | 1.35 | 1 65 | 1.90 | 2.40 | 2.70 | 3.45 | 3.80 | 5.25 | 5.75 | 6.25 |
| 4 | 1.15 | 1.30 | 1.60 | 2.00 | 2.40 | 2.85 | 3.35 | 4.15 | 4.60 | 6.40 | 7.00 | 7.75 |
| 5 | 1.35 | 1.45 | 1.85 | 2.40 | 2.90 | 3.55 | 4.00 | 5.00 | 5.50 | 7.65 | 8.50 | 9.25 |
| 6 | 1.60 | 1.75 | 2.10 | 2.80 | 3.30 | 3.95 | 4.65 | 5.75 | 6.25 | 8.80 | 9.75 | 10.75 |
| 7 | 1.90 | 2.20 | 2.45 | 3.20 | 3.90 | 4.20 | 5.25 | 6.50 | 7.25 | 10.60 | 11.75 | 13.00 |
| 8 | 2.20 | 2.45 | 2.75 | 3.60 | 4.50 | 4.95 | 5.85 | 7.00 | 7.75 | 11.50 | 12.75 | 14.00 |
| 9 | 2.65 | 2.90 | 3.40 | 4.30 | 5.25 | 6.15 | 6.50 | 8.25 | 9.00 | 12.25 | 13.50 | 15.00 |
| 10 | | 3.30 | 4.00 | 4.80 | 5.85 | 6.85 | 7.60 | 9.25 | 10.00 | 13.50 | 15.00 | 16.50 |
| 11 | | 4.50 | 4.80 | 5.00 | 6.25 | 7.25 | 8.00 | 9.75 | 10.75 | | | • • • • • |
| 12 | •••• | 4.75 | 5.10 | 5.25 | 6.50 | 7.65 | 8.50 | 10.50 | 11.50 | | | • • • • • |
| 13 | •••• | 5.50 | 6.00 | 6.00 | 7.00 | 8.25 | • • • • | | | | | • • • • • |
| 14 | | 7.00 | 7.25 | 6.75 | 7.75 | 9.00 | | | | | | • • • • • |
| 15 | | 7.50 | 7.75 | 7.50 | 8.50 | 9.75 | • • • • • | | · · · · · · | | | • • • • • |
| 16 | • • • • • | 8.00 | 8.25 | 8.50 | 9.50 | 10.75 | | | | | | •••• |
| | l | I | I | 10 | 1 | 1 | H | 1 | i i | 1 | l | l |

All openings in Branch Tees for Circulation are tapped right hand.

Branch Tees for Box Coils are always tapped left hand in branches and right hand in back inlet.

The run and back opening of Branch Tees are tapped the same size as branches, unless otherwise ordered.

1-inch Branch Tees, 1-inch or 11/4-inch run, are 11/4 inches inside diameter.

1-inch Branch Tees, 11/2-inch or 2-inch run, are 21/2 inches inside diameter.

114-inch Branch Tees, are all 21/2 inches inside diameter.

11/2-inch Branch Tees are all 21/4 inches inside diameter.

2-inch Branch Tees are all 31/2 inches inside diameter.

Always order Branch Tees by size and number.

FLANGE UNIONS

FACED. NO GASKETS

CAST IRON



Fig. 4377A

MALLEABLE IRON



Fig. 4377B CAST IRON

KEWANEE



Fig. 43770

| CAST THUN | | | | | | | | | | | |
|----------------------------|-------|-------|-------|-------|-------|--------|-------|--|--|--|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 | | | | |
| Price each | .40 | .46 | .52 | . 64 | .78 | 1.00 | 1.25 | | | | |
| Galvanized" | .80 | .92 | 1.04 | 1.28 | 1.56 | 2.00 | 2.50 | | | | |
| Diameter of Flanges inches | 3 | 35/16 | 35/8 | 41/8 | 45/8 | 51/4 | 6 | | | | |
| Number of Bolts in each | 3 | 3 | 3 | 4 | 4 | 4 | 4 | | | | |
| Sizeinches | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | | | | |
| Priceeach | 1.50 | 1.80 | 2.10 | 2.70 | 3.15 | 3.95 | 5.50 | | | | |
| Galvanized" | 3.00 | 3.60 | 4.20 | 5.40 | 6.30 | . 7.90 | 11.00 | | | | |
| Diameter of Flangesinches | 63/4 | 67/8 | 75/8 | 83/4 | 97/6 | 101/6 | 12 | | | | |
| Number of Bolts in each | 4 | 4 | 5 | 5 | 5 | 6 | - 7 | | | | |
| Sizeinches | 8 | 9 | 10 | 12 | 14 | 15 | 16 | | | | |
| Price, each | 7.00 | 10.00 | 11.50 | 16.00 | 28.00 | 35.00 | 60.00 | | | | |
| Galvanized" | 14.00 | 20.00 | 23.00 | 32.00 | 56.00 | 70.00 | | | | | |
| Diameter of Flangesinches | 133/8 | 141/4 | 16 | 181/4 | 205% | 205% | 23 | | | | |
| Number of Bolts in each | 8 | 9 | 10 | 12 | 14 | 14 | 16 | | | | |

MALLEABLE 1RON

| Sizeinches | 3⁄4 | 1 | 11/4 | 11/2 | 2 | 2½ | 3 |
|---|-------|--------------------------|--------------------------|--|-------------------------|--|---------------------------------------|
| Price, Black each " Galvanized " Diameter of Flanges inches Number of Bolts in each | 2.80 | 1.60 3.20 3.4 4 | 2.00 4.00 334 4 | 2.50 5.00 45/8 4 | 3.00 6.00 5½ 4 | 3.50 7.00 6 4 | 4.40 8.80 6 ³ 4 4 |
| Sizeinches | 3½ | 4 | 41/2 | 5 | 6 | 8 | |
| Price, Black each Galvanized " | 10.50 | 12.00 | 14.00 | 16.00 | | 36.00 | |
| Diameter of Flangesinches Number of Bolts in each | | 8 5 | 85/8 5 | $\begin{array}{c c} 9\frac{3}{8} \\ 5 \end{array}$ | 105/8 | $\begin{vmatrix} 13\frac{1}{8} \\ 7 \end{vmatrix}$ | |

KEWANEE FLANGE UNIONS

| Sizeinches | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------------|--|----------------|----------------|---------------------|----------------|----------------|----------------|---------------|
| Priceeach " Galvanized" | $\begin{bmatrix} 80 \\ 1.20 \end{bmatrix}$ | 1.20 1.80 | $1.60 \\ 2.40$ | $\frac{2.00}{3.00}$ | 3.20 4.80 | 4.80 7.20 | 6.00 9.00 | 7.50 11.25 |
| Sizeinches | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | |
| Priceeach " Galvanized" | 8.75 13.00 | 10.00 15.00 | 12.50 18.75 | $15.00 \\ 22.50$ | 18.00 27.00 | 21.60 32.40 | 28.80 43.20 | • • • • |

SPECIAL FITTINGS. ETC.

ADJUSTABLE WEDGE





Fig. 5186A

| 1 | | Speciel Co. |
|------|-------|-------------|
| Fig. | 5186B | |

| | | | | | | | - | | | |
|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Sizeinches | | | | | | | | | | |
| Throw in 50 feetinches | 115 | 96 | 87 | 74 | 79 | 88 | 79 | 70 | 61 | 69 |
| Price per pair | 3.00 | 3.25 | 3.60 | 4.00 | 4.50 | 5.25 | 6.00 | 7.00 | 8.00 | 9.25 |
| Sizeinches | 9 | 10 | 12 | 14 | *16 | *18 | *20 | 22 | 24 | 30 |
| Throw in 50 feetinches | 61 | 68 | 66 | 60 | 60 | 56 | 57 | | | 52 |
| Priceper pair | 10.25 | 11.50 | 13.50 | 16.50 | 22.00 | 28.00 | 35.00 | 43.00 | 53.00 | 65.00 |

*O. D. size. Prices include Copper Gaskets.

The Adjustable Wedge fits within the bolt circle of standard or extra heavy flanges or flanged fittings, and gives any angle up to approximately 10° in any desired direction.

SLOTTED ANGLE FLANGE



Fig. 5186C

| Sizeinches | 2 | 21/2 | 3 | 3½ | 4 | 41/2 | 5 | 6 |
|---------------|-------|-------|-------|-------|-------|-------|-------|------|
| Priceper pair | 3.00 | 4.00 | 4.50 | 5.00 | 6.00 | 6.70 | 7.30 | 8.00 |
| Sizeinches | 7 | 8 | 9 | 10 | 12 | 14 | 16 | |
| Priceper pair | 11.50 | 13.00 | 16.50 | 18.50 | 25.00 | 32.50 | 45.00 | |

Price is complete with bolts and gaskets. Throw in 50 feet of pipe is 8 feet 8 inches,



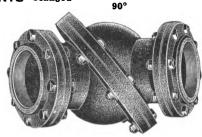


Fig. 5186E

| Sizeinches | $2^{1}\overset{-}{_{2}}$ | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------------------------|--------------------------|-------|--------|--------|--------|--------|--------|
| Price, 45° Faced and Drilledeach | 12.00 | 13.50 | 16.50 | 22.00 | 29.00 | 39.00 | 47.00 |
| Sizeinches | | | | | | | |
| Price, 45° Faced and Drilled each | 58.50 | 70.00 | 100.00 | 130.00 | 180.00 | 225.00 | 280.00 |
| " 90° " " " " " | 78.00 | 93.00 | | | | | |

*O. D. size. Prices include special Copper Gaskets and bolts for center flanges but not companion flanges. These fittings will make any angle from 0 to maximum angle.

FLANGES

COMMON



CIRCULAR.



Fig. 3706A



Fig. 3706B



COMMON

| Size Inches | Price Each | Size Inches | Price Each | Size Inches | Price Each | Size Inches | Price Each |
|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|
| 3/4×4 | .22 | 3 x7 | .62 | 5x12 | 2.20 | 8x15 | 4.00 |
| 3/4 x5 | .30 | 3 x71/2 | . 75 | 5x12½ | 2.20 | 8x16 | 5.00 |
| 1 x5 | .30 | 3 x8 | .90 | 6x10 | 1.50 | 9x15 | 4.00 |
| 1 x6 | .42 | 3 x9 | • 1.15 | 6x11 | 1.75 | 9x16 | 5.00 |
| 11/4×41/2 | .25 | 3½x8 | .90 | 6x12 | 2.20 | 9x17 | 5.75 |
| 11/4x5 | .30 | 31/2x81/2 | 1.00 | 6x12½ | 2.20 | 10x16 | 5.00 |
| 11/4x6 | .40 | 31/2x9 | 1.15 | 6x13 | 2.80 | 10x17 | 5.75 |
| 1½x5 | .30 | 3½x10 | 1.50 | 6x13½ | 2.80 | 10x18 | 7.00 |
| 1½x6 | .40 | 4 x8 | .90 | 6x14 | 3.25 | 10x19 | 7.50 |
| 2 x6 | .42 | 4 x81/2 | 1.00 | 7x12 | 2.20 | 12x18 | 7.00 |
| 2 x6½ | .50 | 4 x9 | 1.15 | 7x12½ | 2.20 | 12x19 | 7.50 |
| 2 x7 | .62 | 4 x10 | 1.50 | 7x13 | 2.80 | 12x20 | 8.50 |
| 2 x8 | .90 | 4½x9 | 1.15 | 7x13½ | 2.80 | 14x20 | 8.50 |
| 2½x6 | .42 | 41/2x91/1 | 1.25 | 7x14 | 3.25 | 14x21 | 9.50 |
| 2½x6½ | .50 | 4½x10 | 1.50 | 7x15 | 4.00 | 15x21 | 9.50 |
| 2½x7 | .62 | 4½x11 | 1.75 | 8x13 | 2.80 | 15x221/4 | 14.00 |
| 2½x8 | .90 | 5 x10 | 1.50 | 8x131/2 | 2.80 | 16x231/2 | 18.00 |
| 3 x61/2 | .50 | 5 x11 | 1.75 | 8x14 | 3.25 | | |

FLOOR

| Size | Price | Size | Price | Size | Price | Size | Price |
|--|-------|--|-------|---------------------|-------|--------|-------|
| Inches | Each | Inches | Each | Inches | Each | Inches | Each |
| $\frac{3}{1}8 \times 3$ $\frac{1}{2} \times 3\frac{1}{2}$ | .10 | $\frac{\frac{34 \times 31/2}{1 \times 4}}{1 \times 4}$ | .15 | 11/4×4 11/2×41/2 | .16 | 2x5½ | .35 |

All Floor Flanges are drilled for screw.

SPECIAL EXTRA HEAVY

| Size Price Size | Price Size | Price Size | Price Size | Price | Size | Price | Size Price |
|--------------------|--------------|--------------|--------------|-------|--------|-------|--------------|
| Inches Each Inches | Each Inches | Each Inches | Each Inches | Each | Inches | Each | Inches Each |
| 3x7 .45 4x9 | .65 5x10 | .85 6x11 | 1.10 + 8x14 | 1.60 | 10x16 | 2.75 | 12x18 3.50 |

CIRCULAR

| Pipe Inches Inches | | Diam. Flange Inches | Pipe Inches | Diam, Flange Inches | Pipe Inches | Diam. Flange Inches | Pipe Inches | Diam. Flange Inches | Pipe Inches | Diam. Flange Inches |
|---|---|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|
| $\begin{array}{c c} 1^{1/2} & 6 \\ 2 & 7 \end{array}$ | $\begin{vmatrix} 2\frac{1}{2} \\ 3 \end{vmatrix}$ | 8 9 | 4 5 | 9 11 | 6 7 | $\frac{12}{13}$ | 8 | 14 17 | 10 12 | 18 20 |

These Flanges being made to order it is always necessary to give the circle they are to fit.



PIPE CLAMPS AND SADDLES

MALLEABLE IRON, WITH WROUGHT IRON STRAPS

WATER PIPE CLAMPS

STEAM PIPE SADDLES







Fig. 9132A Fig. 91

WATER PIPE CLAMPS

| _ | | | | | | | | | | | | | |
|---|---------------------------------------|-----------------------------------|---|--------------------------------|---|---------------------|-----------------|---------------------------------------|-----------------------------------|---|--------------------------------|---|---------------------|
| | CL. | AMPS | WILL I | TIT | 0 | | 1 | Cı | AMPS | WILL F | IT | 0 x | |
| Number | Outside Diameter of Circle, Inches | Size Wrought Iron Pipe, Inches | Size Outside Diameter Casing Inches | Size Cast Iron Pipe, Inches | Size of Wrought Iron Pipe Connections Pipe Clamps are Tapped for, Inches | Price. Each | Number | Outside Diameter of Circle, Inches | Size Wrought Iron Pipe, Inches | Size Outside Diameter Casing Inches | Size Cast Iron Pipe, Inches | Size of Wrought Iron Pipe Connections Pipe Clamps are Tapped for, Inches | Price, Each |
| 0 | 17/8 | 11/2 | 2 | | $\frac{1}{2}$ and $\frac{3}{4}$ | 1.00 | 19 | 65/8 | 6 | $6^{5}\acute{s}$ | | 34 to 11/2 | 2.25 |
| 1 2 3 4 5 6 7 8 9 | 23/8 27/8 31/2 | 2 | 21/2 23/4&3 31/2 31/2 4 4 | | 15 to 1 | 1.00 | 20 | 65/8 | 6 6 | 65 8 65/8 65 8 | • • • • | 2 | 2.50 |
| 2 | 27/8 | 21/2 | $2\frac{3}{4}$ &3 | 2 | $\frac{1}{2}$ to $\frac{1}{4}$ | 1.25 | 21 | 65/8 | 6 | 6^{5} § | | $2\frac{1}{2}$ and 3 | 5.00 |
| 3 | 31.5 | 3 | $3\frac{1}{2}$ | • • • • | 1½ to 1 | 1.25 | 22 | 7 | • • • • • | 7 | 6 6 | 34 to 112 | 2.50 |
| 4 | 31.2 | 3 | 31.2 | | 1¼ to 2 | 1.50 | 23 | 7 | • • • • • | 7 | 6 | 2 , 2 | 2.70 |
| o e | 4 | $\frac{31_{2}}{31_{2}}$ | 4 | 3 | 3/4 and 1 11/4 to 2 | 1.50 | 24 | 75/ | | 75/ | 6 | $2\frac{1}{2}$ and 3 | 5.00 |
| 0 | 41/ | 31/2 | 41 / | 3 | 11/4 to 2 | 1.75 | 25 | 75/8 75/8 | 7 | 75/8 75/8 | • • • • | 34 to 112 | $\frac{2.50}{2.70}$ |
| | 416 | 4 | 41.2 | •••• | 1/2 to 1/2 | $\frac{1.75}{2.00}$ | 26 27 | 758 | 7 | 75/8 | • • • • | 2 | 5.00 |
| 8 | 41.2 41.2 | 4 | 412 | • • • • | $2\frac{2}{3}$ and 3 | 4.00 | 28 | 75% | • | 75/8 | | $\frac{21}{2}$ and 3 | $\frac{5.00}{4.50}$ |
| 10 | 572 | | 5 2 | 4 | $\frac{2^{1/3}}{34}$ to $\frac{1}{1/2}$ | 1.80 | 29 | 9 | •••• | | 7 | 34 to 112 | 5.00 |
| 11 | 5 | 413 | 5 | 4 | 34 to 1½ | $\frac{1.30}{2.15}$ | 30 | 8 8 8 | | 8 8 8 | 7 | $2\frac{1}{2}$ and 3 | 5.50 |
| 12 | 5 5 5 | | 41 2 41 2 5 5 5 | | $2\frac{1}{2}$ and 3 | 4.00 | $30\frac{1}{2}$ | 85% | 8 | 85.5 | | 34 to 11/2 | 5.50 |
| 13 | 51/2 | 41. ₂ | | | 3/4 to 11/2 | 1.80 | 31 | 85 % | Ř | 85 g 85 g | | 2 to 3 | 5.50 |
| 14 | $ 51\frac{2}{2} $ | 5 | 51.3 | | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 2.15 | 32 | 85/8 | 8 | 85% | | 4 | 6.00 |
| 14 15 16 | $\frac{51}{5}$ | 5 5 | 51/2 51/2 51/2 | | $2\frac{1}{2}$ and 3 | 4.00 | 33 | 95% | 9 | - 0 | | 11/2 to 3 | 8.00 |
| 16 | 6 1 | | 6 ~ | 5 | $\frac{1}{2}$ to $\frac{1}{2}$ | 2.00 | 34 | 10 | | 10 | 9 | 3, to 2 | 9.00 |
| 17 | 51.3 6 6 6 | | 6 | 5 5 | 2 | 2.40 | 35 | 1034 | 10 | | | 34 to 2 | 9.00 |
| _18 | 6 | <u></u> | 6 | 5 | $2\frac{1}{2}$ and 3 | 4.50 | 36 | $12\frac{3}{4}$ | 12 | <u> </u> | | $\frac{34}{4}$ to 2 | 10.00 |

Alwaps order Water Pipe Clamps by number. Sizes Nos. 33, 34 and 36 have malleable iron strap.

STEAM PIPE SADDLES

| Size of Pipein. | 11/2 | 2 | $2^{\frac{1}{2}}$ | 3 | 31/2 | 4 | 412 |
|------------------------------|------|--|--------------------|--------------------|-----------------|-----------------|-------------------|
| Tapped for Pipein. Priceeach | | ½ to 1½ 1.00 | 34 to 11.2 1.25 | 34 to 2 1.25 | 34 to 2 1.40 | 34 to 2 1.50 | 34 to 2 2.50 |
| Size of Pipein. | 5 | 5 | 6 | 6 | 7 | 8 | 8 |
| Tapped for Pipein. Priceeach | | $\frac{21/2}{2.75}$ and $\frac{3}{2.75}$ | 3/4 to 2 2.75 | 21/2 to 4 5.75 | 1 to 4 6.50 | 1 to 4 6.50 | 11 5 to 4 8.50 |
| Size of Pipein. | 10 | 10 | 12 | 12 | 15 | 16 | |
| Tapped for Pipein. Priceeach | | 4½ to 6 10.00 | 11/2 to 4 14.00 | 41 ½ to 6 14.00 | 3 to 6 22,00 | 3 to 6 25.00 | |



STEAM JOINT CLAMPS

CLIMAX STEAM JOINT CLAMPS

Nos. 1 and 2

For Repairing Leaks at Pipe Joints

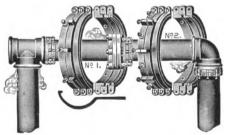


Fig. 721A

| Sizeinches | | | | | | | | | |
|------------|------|------|------|------|-------|-------|-------|-------|-------|
| Priceeach | 1.50 | 1.50 | 1.50 | 1.90 | 2.25 | 3.00 | 3.75 | 4.50 | 5.25 |
| Sizeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Price each | 6.00 | 6.75 | 7.50 | 9.00 | 10.50 | 13.00 | 15.75 | 18.75 | 22.50 |

FOR LARGE O. D. PIPE

| Sizeinches | 14 | 15 | 16 | 18 | 20 | 21 | 22 | 24 | 26 |
|------------|------------|-------|-------|---------------|-------|-------|-------|-------|-------|
| Priceeach | _ 31.50 | 33.75 | 36.00 | 40.5 0 | 45.00 | 50.00 | 55.00 | 60.00 | 65.00 |

The Climax Steam Joint Clamp is made of Brass.

No. 1 Clamps, 1/2 to 5-inch, are always shipped unless otherwise ordered.

No. 2 Clamps, 6-inch and larger, are always shipped unless otherwise ordered.

EMERGENCY PIPE CLAMPS





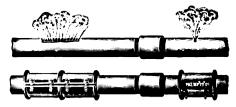


Fig. 721C

| Size of Pipeinches | | | | | | | | | 31/2 |
|------------------------|-----------|-----------------------------|----------------|-------------------------|----------------|-------------------|-----------------------|------------------|------------------|
| Lengthinches Priceeach | 3½ .40 | 3½ .45 | 3½ .50 | 3 ³ 4 .60 | .70 | 41/4 .80 | $\frac{41}{2}$ 1.00 | 5 1.25 | 516 1.50 |
| Size of Pipeinches | 4 | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Length | 6 2.00 | $\frac{6\frac{1}{2}}{4.50}$ | 7 3 5.00 | 8 3 6.00 | 9 3 7.00 | 91/2 3 8.00 | 10 3 9.00 | 11 4 10.00 | 12 4 12.00 |

Sizes 41/2 to 12" are heavy ribbed and strong.

EXTRA HEAVY CAST IRON FITTINGS For a Working Pressure of 250 Pounds

ELBOW

ELROW-REDUCING

45° ELBOW



Fig. 716A



Fig. 716B



Fig. 716C

TEE







Fig. 716D



Fig. 716E FITTINGS



Fig. 716F

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 2½ | 3 | 31/2 | | | |
|--------------|------|------|-------|-------|-------|-------|---------------|-------|----------|--|--|--|
| Elbowseach | .25 | .30 | .35 | .45 | .60 | .75 | 1.25 | 2.00 | 2.75 | | | |
| " Reducing " | | .40 | .45 | .55 | .75 | .95 | 1.55 | 2.50 | 3.40 | | | |
| " 45°" | .35 | .40 | .44 | .55 | .70 | .90 | 1.50 | 2.50 | 3.50 | | | |
| Tees " | .40 | .45 | .55 | .70 | .90 | 1.15 | 1.80 | 3.00 | 4.25 | | | |
| " Reducing " | ' | | .70 | .90 | 1.15 | 1.40 | 2.25 | 3.75 | 5.30 | | | |
| Crosses " | | | .70 | .90 | 1.20 | 1.50 | 2.50 | 4.00 | 5.50 | | | |
| Sizeinches | 4 | 412 | 5 | 6 | 7 | . 8 | 10 | 12 | ••- | | | |
| Elbowseach | 3.50 | 4.25 | 5.50 | 8.00 | 12.00 | 17.00 | 28.0 0 | 40.00 | | | | |
| " Reducing " | 4.40 | 5.30 | 6.80 | 10.00 | 15.00 | 21.00 | 35.00 | 50.00 | | | | |
| " 45°" | 4.50 | 5.50 | 6.75 | 9.75 | 14.50 | 21.00 | 34.00 | 48.00 | | | | |
| Tees " | 5.50 | 6.75 | 8.25 | 12.00 | 18.00 | 25.00 | 42.00 | 60.00 | | | | |
| " Reducing " | 6.85 | 8.50 | 10.25 | 15.00 | 22.50 | 31.00 | 52.00 | 75.00 | | | | |
| Crosses " | 7.00 | 8.50 | 11.00 | 16.00 | 24.00 | 34.00 | 56.00 | 80.00 | <u> </u> | | | |

Galvanized extra heavy fittings double above list.

FLANGE UNIONS Faced, no Gaskets

| 2 2004, 200 | | | | | | |
|---|--------------------|-------------------------------|--|---|-------------------------------|--|
| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
| Diameter of Flanges. inches Number of Bolts in each Price | 3 3 .60 | 31/4 4 .70 | 35/8 4 .80 | $\begin{array}{c} 4\frac{1}{8} \\ 4 \\ 1.00 \end{array}$ | $\frac{4\frac{5}{8}}{4}$ 1.15 | 53/8 5 1.50 |
| Sizeinches | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 |
| Diameter of Flanges inches Number of Bolts in each Price each | 6 5 1.90 | $\frac{6\frac{3}{4}}{6}$ 2.25 | $ \begin{array}{c} 7\frac{1}{2} \\ 6 \\ 2.70 \end{array} $ | 8 7 3.15 | 83/4 8 4.00 | 93/8 8 4.75 |
| Sizeinches | 6 | 7 | 8 | 9 | 10 | 12 |
| Diameter of Flangesinches Number of Bolts in each Priceeach | 107/8 9 6.00 | $12 \\ 10 \\ 8.25$ | $13\frac{1}{4}$ 10 10.50 | $\begin{array}{c} 14\frac{3}{8} \\ 12 \\ 15.00 \end{array}$ | $15\frac{3}{4}$ 12 17.25 | $ \begin{array}{r} 18 \\ 14 \\ 24.00 \end{array} $ |

HYDRAULIC FITTINGS

ELBOW



Fig. 3821A

45° ELBOW



Fig. 3821B



TEE

Fig. 3821C

CROSS



Fig. 3821D

CAST IRON FLANGE UNION



Fig. 3821E

STEEL



Fig. 3821F



Fig. 3821G

CAST IRON FITTINGS FOR 1000 POUNDS WORKING PRESSURE

| Sizeinches | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 |
|-----------------------------------|--------------------|-------------|------|--------------|---------------------|---------------------|--------------|
| Price, Elbows each " 45° Elbows " | .30 | .45 | .50 | 1.00 | .80 1.25 | 1.25 | 1.85 2.25 |
| " Tees " | .45 | . 65 | .75 | 1.05 | 1.30 | 1.90 | 2.75 |
| " Crosses " Flange Unions " | $\frac{.60}{1.20}$ | .90 1.30 | 1.00 | 1.40 1.50 | $\frac{1.60}{2.00}$ | $\frac{2.50}{2.25}$ | 3.70 |
| Sizeinches | 3 | 31/2 | 4 | 41/2 | 5 | 6 | |
| Price, Elbowseach | 2.25 | 2.75 | 3.00 | 4.00 | 5.00 | 6.00 | |
| " 45° Elbows " | 2.50 | 3.00 | 3.50 | 4.50 | 5.25 | 6.25 | |
| " Tees " | 3.30 | 4.00 | 4.50 | 6.00 | 7.50 | 9.00 | |
| " Crosses " | 4.50 | 5.50 | 6.00 | 8.00 | 10.00 | 12.00 | |
| " Flange Unions " | 3.50 | 4.00 | 4.50 | 5.00 | 5.50 | 6.50 | **** |

STEEL FITTINGS, 6000 POUNDS TEST

| = | | | | | | | | |
|---------------------------|-----------------|-----|------|------|------|--------|---------------------|----------------|
| Sizeinches | _3 ₈ | 12 | 34 | 1 | 11/4 | 11/2 | 2 | $2^{1}\hat{2}$ |
| Price, Elbowseach | | | . 75 | .90 | 1.20 | 1.50 | 2.25 | 3.75 |
| " Tees " | .70 | .90 | 1.15 | 1.35 | | | 3.40 | |
| " Crosses " " Couplings " | .90 45 | .55 | 75 | 1.80 | | | $\frac{4.50}{2.25}$ | |
| Couplings | . 10 | | | 1 | 1.20 | A. (A) | | 5.10 |

STEEL FLANGE UNIONS, 6000 POUNDS TEST

| | | | 7113, 00 | 00 100 | 1100 | | |
|--------------------|------------------------|-----------------------------------|-------------------|--------------------|----------------|-------------------------|---------------------|
| Size inches | 1,2 | 34 | 1 | 114 | 112 | 2 | 21,2 |
| Bolt Circle inches | 212 | 2/8 | $\frac{31_{4}}{}$ | $-35^{\circ}8^{-}$ | _ ₄ | 45/8 | $\overline{5}_{14}$ |
| Size Bolt " | $\frac{1}{2} \times 3$ | $\frac{5}{8} \times 3\frac{1}{2}$ | 5 x 4 | 34 x 412 | 7 8 x 434 | $1 \times 5\frac{3}{4}$ | 11/8 x 61/2 |
| Weightpounds | $ 31_{2}$ | 514 | 534 | 812 | 11!4 | 21 | 30 |
| Price per pair | 2.25 | 2.75 | 3.25 | 4.00 | 4.75 | 5.50 | 7.50 |

LONG SWEEP CAST IRON FITTINGS

No. 1 ELBOW No. 2 DOUBLE BRANCH ELBOW

No. 3 TEE

No. 4 CROSS









Fig. 722A

Fig. 722B

Fig. 722C

Fig. 722D

No. 1 ELBOWS

| Sizeinches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------------------------|-----------------------|-------------------|------|-------------------------|----------------------|-------------------------|-------------------------|-------------------------|
| Priceeach " Galvanized" " Reducing" | .32 .64 .48 | .40 .80 .60 | | .80 1.60 1.20 | 1.20 2.40 1.80 | $2.25 \\ 4.50 \\ 3.38$ | 3.25 6.50 4.88 | 3.50 7.00 5.25 |
| Size inches | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Priceeach " Galvanized" " Reducing" | 5.50 11.00 8.25 | | | 13.00 26.00 19.50 | 34.00 | 25.50 51.00 38.25 | 30.00 60.00 45.00 | 40.00 80.00 60.00 |

No. 2 DOUBLE BRANCH ELBOWS

| Size inches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-------------------------------------|--------------------|---------------------|----------------------|----------------------|-------|--------------------------|--------------------------|---------------------------|
| Priceeach " Galvanized" " Reducing" | .64 1.28 .96 | .80 1.60 1.20 | 1.10 2.20 1.65 | 1.60 3.20 2.40 | | 4.50 9.00 6.75 | 6.50 13.00 9.75 | 7.00- 14.00 10.50 |
| Size inches | | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| " Galvanized " | 22.00 | 26.00 | 35.00 | 52.00 | 68.00 | 51.00 102.00 76.50 | 60.00 120.00 90.00 | 80.00 160.00 120.00 |

No. 3 TEES

| Size inches | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|------------------------|-------|-------|--|--|-------|-------------------|----------------|---------------|
| Price each | .48 | . 60 | .82 | 1.20 | 1.80 | 3.40 | 4.90 | 5.25 |
| " Galvanized " | .96 | 1.20 | $\begin{bmatrix} 1.64 \\ 1.23 \end{bmatrix}$ | $\begin{vmatrix} 2.40 \\ 1.80 \end{vmatrix}$ | 3.60 | 6.80 5.10 | $9.80 \\ 7.35$ | 10.50 7.88 |
| reducing | - | 1 .90 | 1 6 | 7.00 | 0 | 0.10 | 10 | 12 |
| Size inches | | 0.75 | 12 95 | 19.50 | 25 50 | $\frac{9}{38.00}$ | 45.00 | 60.00 |
| Priceeach "Galvanized" | | | | | 51.00 | 76.00 | 90.00 | 120.00 |
| " Reducing " | 12.38 | 14.63 | 19.88 | 29.25 | 38.25 | 57.00 | 67.50 | 90.00 |

No. 4 CROSSES

| Size. | inches | 1 | 114 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 |
|-------|-----------------------|-------------|----------------------|-------|-------|-----------------------------|-----------------------|------------------------|------------------------|
| Price | Galvanized" Reducing" | .85 1.70 | 1.10 2.20 1.65 | | | 6.40 | 6.00 12.00 9.00 | 8.75 17.50 13.13 | 9.50 19.00 14.25 |
| Size. | inches | 5 | 6 | 7 | 8 | 9 | 10 | 12 | |
| Price | | 35.00 | 48.00 | 70.00 | 90,00 | $68.00 \\ 136.00 \\ 102.00$ | 160.00 | | |

LONG SWEEP CAST IRON FITTINGS

STRAIGHT BACK TEE



Fig. 723A

ELBOW



Fig. 723B

STRAIGHT BACK TEE



F1g. 723C

STRAIGHT BACK TEES

| Sizeinches | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 |
|-----------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| Priceeach " Reducing" | .64 .96 | .80 1.20 | 1.10 1.65 | 1.60 2.40 | 2.40 3.60 | 4.50 6.75 | 6.50 9.75 | |
| Sizeinches | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Priceeach " Reducing" | 11.00 16.50 | 13.00 19.50 | 17.50 26.25 | 26.00 39.00 | 34.00 51.00 | 51.00 76.50 | 60.00 90.00 | 80.00 120.00 |

ELBOWS, TEES, AND CROSSES With Flanged Ends

| Size | | | in | ches | 2 | 21/2 | 3 | 3½ | 4 | 5 | 6 | 7 | 8 |
|----------|---------|----------------------|----|------|-------|-------|-------|-------|-------|----------------|-------|----------------|----------------|
| Elbows, | Flanged | One End | | | 5.00 | 5.50 | 6.00 | 6.50 | 7.50 | 10.00 | 14.00 | 25.00 | 30.00 |
| Tees, | " | Both Ends One or Two | | " | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 15.00 | 22.00 | 40.00 | 35.00 45.00 |
| Crosses. | " | Three One or Two | " | " | 9.00 | 10.00 | 11.50 | 13.00 | 15.00 | 18.00 | 26.00 | 45.00 55.00 | 50.00 65.00 |
| " | " | Three or For | | 46 | 12.00 | 13.50 | 15.00 | 17.00 | 20.00 | 25.00 25.00 | 35.00 | 60.00 | 70.00 |

Above prices are for Fittings faced and drilled.

BASE ELBOWS AND TEES

BASE ELBOW



Fig. 723D

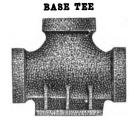


Fig. 723E

BASE ELBOWS, SCREWED

| Sizeinches | 3 | 4 | 41/2 | 5 | 6 |
|------------------|-------|-------|-------|-------|-------|
| Price, Blackeach | 8.00 | 11.00 | 14.00 | 15.00 | 18.00 |
| Sizeinches | 7 | 8 | 9 | 10 | 12 |
| Price, Blackeach | 25.00 | 32.00 | 40.00 | 50.00 | 65.00 |

Base Tees made to order only.

AMMONIA FITTINGS

GLAND END

RI.ROW











Fig. 6255B



Fig. 6255C

WITHOUT COMPANION GLANDS, BOLTS AND GASKETS

| Style of Flange | OVAL | SQUARE | ROUND | | | | |
|-----------------|--------------------------------|--|---|--|--|--|--|
| Sizeinches | 14 88 12 34 100 125 140 175 | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | 3 3½ 4 5 6 10.00 13.50 15.00 20.00 30.00 | | | | |
| Tees " | 1.50 1.75 1.95 2.20 | 2.50 3.70 3.75 4.00 8.00 | 17.00 21.00 23.50 29.00 36.00 | | | | |
| Crosses " | 1.75 2.40 2.50 3.00 | 3.30 4.95 5.00 6.00 10.00 | 23.00 26.00 30.00 38.00 47.00 | | | | |

WITH COMPANION GLANDS, BOLTS AND GASKETS

| Style of Flange | O | AL | | SQUARE | Round | | | | |
|-----------------|-----------|-----------|-----------|--------------------------------|---|--|--|--|--|
| Sizeinches | 14 38 | 1/2 3/4 | 1 + 114 | $ 1\frac{1}{2} 2 2\frac{1}{2}$ | 3 3½ 4 5 6 13.5017.0021.0028.5040.00 | | | | |
| Elbows each | 2.00 2.40 | 2.45 2.75 | 3.50 4.75 | 5.00 6.00 11.00 | 13.50 17.00 21.00 28.50 40.00 | | | | |
| | | | | | 26.0031.0034.5043.0053.00 | | | | |
| Crosses " | 3.60 4.25 | 4.75 5.30 | 5.80 9.95 | 10.00 11.50 18.25 | 31.00 37.00 44.00 53.00 65.00 | | | | |

RETURN BENDS, SCREW ENDS WITH GLAND SOLID DIVIDED



Fig. 6255D



Fig. 6255E

SOLID

| Sizeinches | 114 2 | 2 2 | $\overline{2 \mid 2}$ |
|--|-----------|-----------|-----------------------|
| Center to Centerinches | 6 45% | 6 8 | 10 12 |
| Center to Center inches Without Glands, Bolts and Gaskets each | 2.40 2.60 | 2.85 3.40 | 4.25 5.10 |
| With " " " " " " " | 3.90 4.60 | 4.85 5.40 | 6.25 7.10 |

DIVIDED

| Sizeinches | 1!4 | 2 |
|---------------------------------------|------|------|
| Center to Centerinches | 6 | 456 |
| Without Glands, Bolts and Gasketseach | | 4.80 |
| With " " " " " | 5.10 | 6.80 |

AMMONIA FITTINGS

FLANGE UNION







Fig. 6256A

FLANGE UNIONS

Fig. 6256B

| Style of Flange | | ' | | | | | | Hexagon | | | | |
|-------------------------|------|----------------------|--------------------|---|--|------------|---------------------|---------|---|-----------|-------------|------------|
| Sizeinches Priceeach | 1.35 | $\frac{3}{8}$ 1.35 | $\frac{1}{2}$ 1.50 | $\begin{vmatrix} \frac{34}{1.50} \end{vmatrix}$ | $\begin{array}{c} 1 \\ 1.50 \end{array}$ | 1½ 1.75 | $\frac{11/2}{2.25}$ | 3.00 | $\begin{array}{ c c }\hline 2\frac{1}{2}\\ 6.00\end{array}$ | 3 9.00 | 3½ 11.50 | 4 14.00 |

The 4-inch union has 4 bolts.

BOYLE UNIONS

| Style of Flange | | Ov | AL | 1 | | | | | SQUA | RE | | | | |
|-------------------------|------|------|--------------------|-------------|--|--|-----------------------------|------------------|--|-----------|---|------------|------------|---|
| Sizeinches Priceeach | 1.05 | 1.15 | $\frac{1}{2}$ 1.35 | 3.4 1.60 | $\begin{array}{c} 1 \\ 1.95 \end{array}$ | $\begin{array}{c} 1^{1} \mathbf{\cancel{4}} \\ 2.65 \end{array}$ | $\frac{1\frac{1}{2}}{3.10}$ | $\frac{2}{3.70}$ | $\begin{vmatrix} 21/2 \\ 6.25 \end{vmatrix}$ | 3 9.50 | $\begin{vmatrix} 3!/2 \\ 11.50 \end{vmatrix}$ | 4 13.65 | 5 18.00 | $\begin{array}{c} 6 \\ 22.00 \end{array}$ |
| BRINE RETURN BENDS | | | | | | | | | | | | | | |

| Sizeinches | 1 | 1 | 1 | 11/4 | 114 | 11/4 | 114 | 114 | 1!4 |
|----------------------------------|-------------|-------------------|------|----------------------|--------------------------|-----------|---|------|------|
| Center to Centerinches Priceeach | 13/4 .60 | $\frac{21/2}{75}$ | 3 | $\frac{2^{1}4}{.90}$ | 21/2 | 3 1.00 | 31/2 | 1 20 | 6 |
| Sizeinches | | 11/6 | 11/6 | 2 | 2 | 2 | $\begin{vmatrix} 1.10 \\ 2 \end{vmatrix}$ | 2 | 1.00 |
| Center to Centerinches | 3 | -62- | 8 | $-\frac{1}{3}$ | $\frac{1}{3\frac{1}{2}}$ | -4- | 6 | 8 | -: |
| Priceeach | 1.15 | 1.75 | 2.00 | 1.25 | 1.30 | 1.90 | 3.25 | 3.50 | |

Extra price charged for tapping right and left.

RETURN BEND



QUARTER BEND

GOOSE NECK

Fig. 6256E

Fig. 6256C

WROUGHT IRON RETURN BENDS

| Sizeinches | 1 | 11/4 | 11/2 | 2 |
|--|------|------|------|---|
| Minimum Distance between Centersinches | 41/2 | 6 | 8 | 8 |
| " Length Center to End " | 5 | В | R | R |

QUARTER BENDS

| Sizeinches | | 11/4 | 11/2 | 2 |
|----------------|----------|--------------|------|--------------|
| Minimum Radius | 2½ 4½ | 43/4 61/2 | 63/4 | 63/4 91/6 |

GOOSE NECKS

| Sizeinches | 34 | 1 | 11, |
|--|-----|------|-----|
| Minimum Distance between Centersinches | 4 | 41,5 | 6 |
| " Length Center to End " | 334 | 414 | 6 |

Prices on bends will be quoted upon receipt of dimensions and number required.

AMMONIA VALVES GLAND END

GLOBE

ANGLE



CHECK









Fig. 6257A

Fig. 6257B

WITHOUT COMPANION GLANDS, BOLTS AND GASKETS

| Style of Flange | | 0 | VAL | | | | SQUAR | Е | | ROUND | | | | |
|----------------------------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------------|--------|--------|
| Size inches Clobe Valves each | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 114 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 68.40 | 5 | 6 |
| Clobe Valves each | 5.00 | 5.75 | 6.00 | 7.25 | 8.00 | 13.50 | 14.50 | 18.00 | 26.50 | 42.00 | 53.40 | 68.40 | 99.60 | 134.40 |
| Angle " " | 5.00 | 5.75 | 6.00 | 7.25 | 8.00 | 13.50 | 14.50 | 18.00 | 26.50 | 42.00 | 53.40 | 68.40 | 99.60 | 134.40 |
| Cross " " | l | | 8.40 | 10.00 | 11.00 | 17.80 | 18.75 | 24.00 | 34.50 | 53.50 | 69.25 | 88.25 | 128.50 | 175.00 |
| Check " " | | | 8.40 | 9.60 | 10.70 | 17.80 | 19.00 | 22.50 | 33.30 | 51.50 | 65.60 | 85.00 | 122.00 | 164.00 |

WITH COMPANION GLANDS, BOLTS AND GASKETS

| Style of Flange | C | VAL | | | SQUAR | Е | | | | ROUNI |) | |
|---------------------------------|-----------|------------|-------------------|-------|-------|-------|----------------|-------|-------|-------|--------|--------|
| Bize inches GlobeValves each | 1/4 3/8 | 1/2 3/4 | 1 | 1!4 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31 3 | 4 | 5 | 6 |
| Globe Valves each | 6.40 7.25 | 7.75 9.0 |) 10 . 00 | 16.50 | 18.50 | 22.50 | 34.00 | 52.80 | 66.60 | 82.80 | 117.60 | 158.40 |
| Angle " " | | 7.75 9.0 | | | | | | | | | | |
| Cress " " | l | 10.25 12.4 | | | | | | | | | | |
| Check " " | | 9.70 10.8 | 12.50 | 20.45 | 21.65 | 26.05 | 38.60 | 60.40 | 76.55 | 97.75 | 138.00 | 185.00 |







Fig. 6257E

Fig. 6257F

| WITHOUT | COMPANION | GLANDS, | BOLTS | AND | GASKET | 's |
|---------|-----------|---------|-------|-----|--------|----|
| | | | | | | |

| Sizeinches | 1/4 | 3 8 | 1/2 | 34 |
|-----------------------------|--------------|--------------|--------------|----------------|
| Globe Valveseach Angle " | 5.00 5.00 | 5.75 5.75 | 6.00 6.00 | $7.25 \\ 7.25$ |
| WITH COMPANION | GLANDS, | BOLTS AND | GASKETS | |
| Sizeinches | 1/4 | 3/8 | 1/2 | 3/4 |
| Globe Valveseach | 6.40 6.40 | 7.25 7.25 | 7.75 7.75 | 9.00 |



For 125 Pounds Working Pressure

ELBOWS



Fig. 24A



STANDARD

45°

| | Comton | Diameter | PRICE | , Еасн | | Center | Diameter | PRICE, | Елсн |
|----------------|----------------------|-------------------------|--------------------------|---|----------------|----------------------|-------------------------|--------------------------|---|
| Size Inches | to Face Inches | of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | to Face Inches | of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 11/4 | 33/4 | 41/2 | 4.75 | 5.75 | 11/4 | 2 | 41/2 | . 5.25 | 6.25 |
| 11/2 | 4 | 5 | 4.75 | 5.75 | 11/2 | 21/4 | 5 | 5.25 | 6.25 |
| 2 | 41/2 | 6 | 4.75 | 5.75 | 2 | 2½ | 6 | 5.25 | 6.25 |
| $2\frac{1}{2}$ | 5 | 7 | 5.00 | 6.25 | 2½ | 3 | 7 | 5.50 | 6.75 |
| 3 | 5½ | 71/2 | 5.75 | 7.00 | 3 | 3 | 7½ | 6.25 | 7.50 |
| 3½ | 6 | 81/2 | 6.50 | 7.75 | 3½ | 3½ | 81/2 | 7.25 | 8.50 |
| 4 | 6½ | 9 | 7.25 | 9.25 | 4 | 4 | 9 | 8.00 | 10.00 |
| 41/2 | 7 | 91/4 | 9.00 | 11.00 | 41/2 | 4 | 91/4 | 10.00 | 12.00 |
| 5 | 7½ | 10 | 9.75 | 11.75 | 5 | 41/2 | 10 | 10.75 | 12.75 |
| 6 | 8 | 11 | 12.00 | 14.00 | 6 | 5 | 11 | 13.00 | 15.00 |
| 7 | 81/2 | $12\frac{1}{2}$ | 16.00 | 19.75 | 7 | 51/2 | 12½ | 16.00 | 19.75 |
| 8 | 9 | 13½ | 20.00 | 23.75 | 8 | 51/2 | 13½ | 20.00 | 23.75 |
| 9 | 10 | 15 | 26.00 | 30.00 | 9 | 6 | 15 | 26.00 | 30.00 |
| 10 | 11 | 16 | 32.00 | 36.00 | 10 | 61/2 | 16 | 32.00 | 36.00 |
| 12 | 12 | 19 | 44.00 | 50.00 | 12 | 7½ | 19 | 44.00 | 50.00 |
| 14 | 14 | 21 | 58.00 | 65.00 | 14 | 7½ | 21 | 58.00 | 65.00 |
| 15 | 141/2 | $22\frac{1}{4}$ | 72.00 | 80.00 | 15 | 8 | 221/4 | 72.00 | 80.00 |
| 16 | 15 | 23½ | 84.00 | 93.00 | 16 | 8 | 231/2 | 84.00 | 93.00 |

Larger sizes made to order. Prices on application. Furnished faced only, unless otherwise ordered.

For 125 Pounds Working Pressure TEES

STANDARD

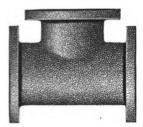


Fig. 25A

REDUCING



Fig. 25B

STANDARD

REDUCING Reducing in Run or Branch

| | ! | | | PRICE, | , EACH | 1 | PRICE | , Еасн |
|----------------|-----------------------------|---------------------------|-------------------------------------|--------------------------|---|----------------|--------------------------|---|
| Size Inches | Center to Face Inches | Face to Face Inches | Diameter of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 11/4 | 33/4 | 7½ | 41/2 | 7.00 | 8.50 | | •••• | |
| 112 | 4 | 8 | 5 | 7.00 | 8.50 | 11/2 | 8.00 | 9.50 |
| 2 | 41/2 | 9 | 6 | 7.00 | 8.50 | 2 | 8.00 | 9.50 |
| $2\frac{1}{2}$ | 5 | 10 | 7 | 7.25 | 9.00 | 2½ | 8.25 | 10.00 |
| 3 | 51/2 | 11 | 71/2 | 8.25 | 10.00 | 3 | 9.50 | 11.25 |
| 31/2 | 6 | 12 | 81/2 | 9.50 | 11.25 | 3½. | 11.00 | 12.75 |
| 4 | 61/2 | 13 | 9 | 10.50 | 13.50 | 4 | 12.00 | 15.00 |
| 41/2 | 7 | 14 | 91/4 | 13.00 | 16.00 | 41/2 | 15.00 | 18.00 |
| 5 | 7½ | 15 | 10 | 14.25 | 17.25 | 5 | 16.25 | 19.25 |
| 6 | 8 | 16 | 11 | 17.50 | 20.50 | 6 | 20.00 | 23.00 |
| 7 | 81/2 | 17 | 121/2 | 23.00 | 28.75 | 7 | 26.5 0 | 32.00 |
| 8 | 9 | 18 | 131/2 | 29.00 | 34.75 | 8 | 33.50 | 39.00 |
| 9 | 10 | 2 0 | 15 | 38.00 | 41.00 | 9 | 43.50 | 50.00 |
| 10 | 11 | 22 | 16 | 46.50 | 52.50 | 10 | 53.50 | 60.00 |
| 12 | 12 | 24 | 19 | 64.00 | 73.00 | 12 | 74.00 | 83.00 |
| 14 | 14 | 28 | 21 | 84.00 | 95.00 | 14 | 96.00 | 107.00 |
| 15 | 141/2 | 29 | 221/4 | 105.00 | 117.00 | 15 | 120.00 | 132.00 |
| 16 | 15 | 30 | 231/2 | 122.00 | 135.00 | 16 | 140.00 | 153.00 |
| | 1 | I | | | 1 | ı | | 1 |

Larger sizes made to order. Prices on application.

Furnished faced only, unless otherwise ordered.



For 125 Pounds Working Pressure

SINGLE SWEEP TEES

STANDARD

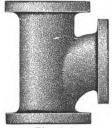


Fig. 26A

REDUCING

Fig. 26B

STANDARD

REDUCING Reducing in Run or Branch

| | | | Diameter | Price | . Едсн | | PRICE | , Елсн |
|----------------|-----------------------------|---------------------------|-------------------------|-----------------------|--------------------------------------|----------------|-----------------------|--------------------------------------|
| Size Inches | Center to Face Inches | Face to Face Inches | of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 2 | 41/2 | 9 | 6 | 8.00 | 9.50 | | | |
| 212 | 5 | 10 | 7 | 8.25 | 10.00 | 21/2 | 9.50 | 11.25 |
| 3 | 51/2 | 11 | 712 | 9.50 | 11.25 | 3 | 11.00 | 12.75 |
| 312 | 6 | 12 | 81/2 | 11.00 | 12.75 | 3½ | 12.50 | 14.25 |
| 4 | 612 | 13 | 9 | 12.00 | 15.00 | 4 | 13.75 | 16.75 |
| 41/2 | 7 | 14 | 91/4 | 15.00 | 18.00 | 412 | 17.25 | 20.25 |
| 5 | 7½ | 15 · | 10 | 16.25 | 19.25 | 5 | 18.75 | 21.75 |
| 6 | 8 | 16 | 11 | 20.00 | 23.00 | 6 | 23.00 | 26.00 |
| 7 | 812 | 17 | 121/2 | 26.50 | 32.00 | 7 | 30.00 | 35.50 |
| 8 | 9 | 18 | 131/2 | 33.50 | 39.00 | 8 | 38.50 | 44.00 |
| 9 | 10 | 20 | 15 | 43.50 | 50.00 | 9 | 50.00 | 56.50 |
| 10 | 11 | 22 | 16 | 53.50 | 60.00 | 10 | 61.50 | 68.00 |
| 12 | 12 | 24 | 19 | 74.00 | 83.00 | 12 | 85.00 | 94.00 |
| 14 | 14 | 28 | 21 | 96.00 | 107.00 | 14 | 110.00 | 121.00 |
| 15 | 1412 | 29 | 221_4 | 120.00 | 132.00 | 15 | 138.00 | 150.00 |
| 16 | 15 | 30 | $23^{1}_{\cdot 2}$ | 140.00 | 153.00 | 16 | 160.00 | 173.00 |

Larger sizes made to order. Prices on application.

Reducing Single Sweep Tees made to order only.

Furnished faced only, unless otherwise ordered.

Single Sweep Tees with the side opening larger than the run not made.

For 125 Pounds Working Pressure

DOUBLE SWEEP TEE



Fig. 27A

DOUBLE SWEEP TEES

REDUCING DOUBLE SWEEP

Reducing in Branch

| | | | | Prici | е, Еасн | | Price | , Елсн |
|----------------|-----------------------------|---------------------------|----------------------------------|--------------------------|---|----------------|--------------------------|---|
| Size Inches | Center to Face Inches | Face to Face Inches | Diameter of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 2 | 41/2 | 9 | 6 | 8.00 | 9,50 | | | |
| 21/2 | 5 | 10 | 7 | 8.25 | 10.00 | 21/2 | 9.50 | 11.25 |
| 3 | 51/2 | 11 | 71/2 | 9.50 | 11.25 | 3 | 11.00 | 12.75 |
| 31/2 | 6 | 12 | 81/2 | 11.00 | 12.75 | 31/2 | 12.50 | 14.25 |
| 4 | 61/2 | 13 | 9 | 12.00 | 15.00 | 4 | 13.75 | 16.75 |
| 41/2 | 7 | 14 | 91/4 | 15.00 | 18.00 | 41/2 | 17.25 | 20.25 |
| 5 | 71/2 | 15 | 10 | 16.25 | 19.25 | 5 | 18.75 | 21.75 |
| 6 | 8 | 16 | 11 | 20.00 | 23.00 | 6 | 23.00 | 26.00 |
| 7 | 81/2 | 17 | 121/2 | 26.50 | 32.00 | 7 | 30.00 | 35.50 |
| 8 | 9 | 18 | 131/2 | 33. 50 | 39.00 | 8 | 38.50 | 44.00 |
| 9 | 10 | 20 | 15 | 43.50 | 50.00 | 9 | 50.00 | 56.50 |
| 10 | 11 | 22 | 16 | 53.50 | 60.00 | 10 | 61.50 | 68.00 |
| 12 | 12 | 24 | 19 | 74.00 | 83.00 | 12 | 85.00 | 94.00 |
| 14 | 14 | 2 8 | 21 | 96.00 | 107.00 | 14 | 110.00 | 121 00 |
| 15 | 141/2 | 29 | 221/4 | 120.00 | 132.00 | 15 | 138.00 | 150.00 |
| 16 | 15 | 30 | 231/2 | 140.00 | 153.00 | 16 | 160.00 | 173.00 |

Larger sizes made to order. Prices on application.

Furnished FACED ONLY, unless otherwise ordered.

Double Sweep Flanged Tees are not made reducing on the run.

Reducing Double Sweep Tees on the run made to order only.

Double Sweep Tees can only be made increasing on the branch within a reasonable limit

For 125 Pounds Working Pressure

STANDARD



Fig. 28A

CROSSES



Fig. 28B

STANDARD

REDUCING

| | | Center | | Price | в, Елсн | İ | Pric | в, Елсн |
|----------------|---------------------------|----------------------|----------------------------------|--------------------------|--------------------------------------|----------------|--------------------------|--------------------------------------|
| Size Inches | Face to Face Inches | to Face Inches | Diameter of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 11/4 | 7½ | 33/4 | 41/2 | 9.50 | 11.50 | | •••• | •••• |
| 11/2 | 8 | 4 | 5 | 9.50 | 11.50 | | •••• | |
| 2 | 9 | 41/2 | 6 | 9.50 | 11.50 | 2 | 11.00 | 13.00 |
| 2½ | 10 | 5 | 7 | 10.00 | 12.50 | 21/2 | 11.50 | 14.00 |
| 3 | 11 | 51/2 | 71/2 | 11.50 | 14.00 | 3 | 13.25 | 15.75 |
| 3½ | 12 | 6 | 812 | 13.00 | 15.50 | 31/2 | 15.00 | 17.50 |
| 4 | 13 | 61/2 | 9 | 14.50 | 18.50 | 4 | 16.75 | 20.75 |
| 41/2 | 14 | 7 | 91/4 | 18.00 | 22.00 | 41/2 | 20.75 | 25.00 |
| 5 | 15 | 71/2 | 10 | 19.50 | 23.50 | 5 | 22.50 | 26.50 |
| 6 | 16 | 8 | 11 | 24.00 | 28.00 | 6 | 27. 50 | 31.50 |
| 7 | 17 | 81/2 | 121/2 | 32.00 | 39.50 | 7 | 37.00 | 45.00 |
| 8 | 18 | 9 | 131/2 | 40.00 | 47.50 | 8 | 46.00 | 53.50 |
| 9 | 20 | 10 | 15 | 52.00 | 60.00 | 9 | 60.00 | 68.00 |
| 10 | 22 | 11 | 16 | 64.00 | 72.00 | 10 | 74.00 | 82.00 |
| 12 | 24 | 12 | 19 | 88.00 | 100.00 | 12 | 100.00 | 112.00 |
| 14 | 28 | 14 | 21 | 116.00 | 130.00 | 14 | 132.00 | 146.00 |
| 15 | 29 | 141/2 | 2214 | 144.00 | 160.00 | 15 | 165.00 | 180.00 |
| 16 | 30 | 15 | 231/2 | 168.00 | 186.00 | 16 | 193.00 | 210.00 |

Larger sizes made to order. Prices on application.

Furnished faced only unless otherwise ordered

Reducing Crosses made to order only.

For 125 Pounds Working Pressure

LATERALS



Fig. 29A

STANDARD

REDUCING Reducing In Run or Branch

| | | Center to | 77 4 . | PRICE | , Елсн | | PRICE, EACH | | |
|----------------|-------------------------|---------------------------------------|-------------------------------------|-----------------------|--------------------------------------|----------------|-----------------------|--------------------------------------|--|
| Size Inches | of Flanges Inches | Face of Run or Outlet Inches | Face to Face of Run Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges | |
| 2 | 6 | 8 | 101 2 | 9.50 | 11.50 | | | | |
| $2\frac{1}{2}$ | 7 | $9\frac{1}{2}$ | 12 | 10.00 | 12.50 | | | | |
| 3 | 71/2 | 10 | 13 | 11.50 | 14.00 | | | | |
| 314 | 81 2 | 111/2 | 141/2 | 13.00 | 15.50 | | | | |
| 4 | 9 | 12 | 15 | 14.50 | 18.50 | 4 | 16.75 | 20.75 | |
| 415 | 914 | 121/2 | 151/2 | 18.00 | 22.00 | 41/2 | 20.75 | 25.00 | |
| 5 | 10 | 131/2 | 17 | 19.50 | 23.50 | 5 | 22.50 | 26.50 | |
| 6 | 11 | 141/2 | 18 | 24.00 | 28.00 | 6 | 27.50 | 31.50 | |
| 7 | 121/2 | 161/2 | 201/2 | 32.00 | 39.50 | 7 | 37.00 | 45.00 | |
| 8 | 131 4 | 171/2 | 22 | 40.00 | 47.50 | 8 | 46.00 | 53.50 | |
| 8 | 15 | 191/2 | 24 | 52.00 | 60.00 | 9 | 60.00 | 68.00 | |
| 10 | 16 | 201/2 | 251/2 | 64.00 | 72.00 | 10 | 74.00 | 82.00 | |
| 12 | 19 | 241/2 | 30 | 88.00 | 100.00 | 12 | 100.00 | 112.00 | |
| 14 | 21 | 27 | 33 | 116.00 | 130.00 | 14 | 132.00 | 146.00 | |
| 15 | 2214 | 281/2 | 341/2 | 144.00 | 160.00 | 15 | 165.00 | 180.00 | |
| 16 | 231/2 | 30 | 361/2 | 168.00 | 186.00 | 16 | 193.00 | 210.00 | |

Note.—Larger sizes made to order. Prices on application.

Flanged Fittings will always be furnished faced only unless otherwise ordered.

Reducing Laterals made to order only.

STANDARD FLANGED FITTINGS For 125 Pounds Working Pressure

REDUCING TAPER ELBOWS



Fig. 705 A

| Size | Discourse | Dale Olaska | C C F | Pric | E, EACH |
|------------|---|--------------------------------------|--------------------------|-----------------------|-----------------------------------|
| Inches | Diameter of Flanges, Inches | Bolt Circles Inches | Center to Face Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 3 x 1½ | 7½x 5 | 6 x 37/8 | 51/2 | 11.50 | 14.00 |
| 3 x 2 | 7½x 6 | 6 x 43/4 | $51\frac{7}{2}$ | 11.50 | 14.00 |
| 3 x 21/2 | 71/2x 7 | 6 x 51/2 | 51/2 | 11.50 | 14.00 |
| 31/2x 2 | 8½x 6 | $7 \times 43\frac{2}{4}$ | 6 | 13.00 | 15.00 |
| 31/2x 21/2 | 81/2x 7 | 7 x 51/2 | 6 | 13.00 | 15.50 |
| 3½x 3 | 81/2x 71/2 | 7 x 6 | 6 | 13.00 | 15,50 |
| 4 x 2 | 9 x 6 | 71/2x 43/4 | 61/2 | 14.50 | 18.50 |
| 4 x 21/2 | 9 x 7 | 71/2x 51/2 | 61/2 | 14.50 | 18.50 |
| 4 x 3 | 9 x 71/2 | 7½x 5½ | 61/2 | 14.50 | 18.50 |
| 5 x 21/2 | 10 x 7 | 8½x 6 | 71/2 | 19.50 | 23.50 |
| 5 x 3 | 10 x 7½ | 8½x 6 | 71/2 | 19.50 | 23.50 |
| 5 x 4 | 10 x 9 | 8½x 7½ | 71/2 | 19.50 | 23.50 |
| 6 x 21/2 | 11 x 7 | 9½x 5½ | 8 8 | 24.00 | 28.00 |
| 6 x 3 | 11 x 7½ | 9½x 6 | 8 | 24.00 | 28.00 |
| 6 x 3½ | 11 x 8½ | 9½x 7 | 8 | 24.00 | 28.00 |
| 6 x 4 | 11 x 9 | 9½x 7½ | 8 | 24.00 | 28.00 |
| 6 x 5 | 11 x10 | 91/2x 81/2 | 8 | 24.00 | 28.00 |
| 7 x 5 | 12½x10 | | | 32.00 | 39.50 |
| 7 x 6 | $\frac{12\sqrt{2}\times10}{12\sqrt{6}\times11}$ | 1034 x 81/2 | 81/2 | 32.00 | 39.50 |
| 8 x 3½ | 12½X11 | 103/4 x 91/2 | 81/2 | 40.00 | 47.50 |
| 8 x 4 | 13½x 8½ | 1134 x 7 | 9 | | 47.50 |
| 8 x 5 | 13½x 9 | 1134 x 71/2 | 9 | 40.00 | |
| 8 x 6 | 13½x10 | 1134 x 81/2 | 9 | 40.00 | 47.50 |
| 8 x 7 | 13½x11 | 1134 x 91/2 | | 40.00 | 47.50 |
| | $\frac{131}{2}$ x $\frac{121}{2}$ | 1134x1034 | 9 | 40.00 | 47.50 |
| | 15 x11 | 13 4 x 91/2 | 10 | 52.00 | 60.00 |
| 9 x 8 | 15 x13½ | 131/4×113/4 | 10 | 52.00 | 60.00 |
| 10 x 5 | 16 x10 | 141/4 x 81/2 | 11 | 64.00 | 72.00 |
| 10 x 6 | 16 x11 | 1414 x 91/2 | 11 | 64.00 | 72.00 |
| 10 x 7 | 16 x12½ | $14\sqrt{4} \times 10^{3}$ | 11 | 64.00 | 72.00 |
| 10 x 8 | 16 x13½ | $14\frac{1}{4} \times 11\frac{3}{4}$ | 11 | 64.00 | 72.00 |
| 10 x 9 | 16 x15 | $14\frac{1}{4} \times 13\frac{1}{4}$ | 11 | 64.00 | 72.00 |
| 12 x 6 | 19 x11 | 17 x $9\frac{1}{2}$ | 12 | 88.00 | 100.00 |
| 12 x 7 | 19 x12½ | 17×10^{3} | 12 | 88.00 | 100.00 |
| 12 x 8 | 19 x13½ | 17 x1134 | 12 | 88.00 | 100,00 |
| 12 x10 | 19 x16 | 17 x1414 | 12 | 88.00 | 100.00 |
| 14 x10 | 21 x16 | 1834x1414 | 14 | 116.00 | 130.00 |
| 14 x12 | 21 x19 | 183/4×17 | 14 | 116.00 | 130.00 |
| 15 x10 | 221/4×16 | 20 x141/4 | 141/2 | 144.00 | 160.00 |
| 15 x12 | 221/4×19 | 20 x17 | 141/2 | 144.00 | 160.00 |
| 16 x12 | 23½x19 | 211/4×17 | 15 | 168.00 | 186.00 |
| 16 x14 | 23½x21 | 211/4 x 183/4 | 15 | 168.00 | 186.00 |
| 16 x15 | 231/2x221/4 | 2114 x 20 | 15 | 168.00 | 186,00 |

Elbows not listed above, made to order at special price. Flanged fittings will be furnished faced only unless otherwise ordered.

For 125 Pounds Working Pressure

TAPER REDUCERS



Fig. 92A

| Size Inches | Diameter of Flanges Inches | Face to Face Inches | Bolt Circles Inches | Size Inches | Diameter of Flanges Inches | Face to Face Inches | Bolt Circles Inches |
|----------------|-------------------------------------|------------------------------|-------------------------------------|----------------|--------------------------------------|------------------------------|--------------------------------------|
| 3 x2 | 7½x 6 | 6 | 6 x43/4 | 10x 4 | 16 x 9 | 12 | 14¼x 7½ |
| 31/2x21/2 | 81/2× 7 | 61/2 | 7 x5½ | 10x 5 | 16 x10 | 12 | 141/4 x 81/2 |
| 4 x2 | 9 x 6 | 7 | 7½x4¾ | 10x 6 | 16 x11 | 12 | $14\frac{1}{4} \times 9\frac{1}{2}$ |
| 4 x2½ | 9 x 7 | 7 | 7½x5½ | 10x 8 | 16 x13½ | 12 | 141/4×113/4 |
| 4 x3 | 9 x 7½ | 7 | 7½x6 | 12x 5 | 19 x10 | 14 | 17 x 8½ |
| 5 x2 | 10 x 6 | 8 | 81/2×43/4 | 12x 6 | 19 x11 | 14 | 17 x 9½ |
| 5 x2½ | 10 x 7 | 8 | $8\frac{1}{2}x5\frac{1}{2}$ | 12x 8 | 19 x13½ | 14 | 17 x1134 |
| 5 x3 | 10 x 71/2 | 8 | 8½x6 | 12x10 | 19 x16 | 14 | $17 \times 14\frac{1}{4}$ |
| 5 x4 | 10 x 9 | 8 | $8\frac{1}{2}$ x $7\frac{1}{2}$ | 14x 6 | 21 x11 | 16 | 1834x 91/2 |
| 6 x3 | 11 x 7½ | 9 | 9½x6 | 14x 8 | $21 \times 13\frac{1}{2}$ | 16 | $18\frac{3}{4} \times 11\frac{3}{4}$ |
| 6 x3½ | 11 x 8½ | 9 | 9½x7 | 14x10 | 21 x16 | 16 | $18\frac{3}{4} \times 14\frac{1}{4}$ |
| 6 x4 | 11 x 9 | 9 | 9½x7½ | 14x12 | 21 x19 | 16 | 18¾x17 |
| 6 x5 | 11 x10 | 9 | 9½x8½ | 15x 8 | 2214x131/2 | 17 | 20 x1134 |
| 7 x3 | 12½x 7½ | 10 | 10¾x6 | 15x10 | 22½x16 | 17 | $20 \times 14\frac{1}{4}$ |
| 7 x4 | 12½x 9 | 10 | $10\frac{3}{4}$ x7 $\frac{1}{2}$ | 15x12 | 22¼x19 | 17 | 20 x17 |
| 7 x5 | 12½x10 | 10 | $10\frac{3}{4}$ x $8\frac{1}{2}$ | 15x14 | 22¼x21 | 17 | 20 x183/4 |
| 7 x6 | 12½x11 | 10 | 1034 x91/2 | 16x 8 | $23\frac{1}{2} \times 13\frac{1}{2}$ | 18 | $21\frac{1}{4} \times 11\frac{3}{4}$ |
| 8 x3 | 13½x 7½ | 11 | 1134 x6 | 16x10 | 23½x16 | 18 | $21\frac{1}{4} \times 14\frac{1}{4}$ |
| 8 x4 | 13½x 9 | 11 | 1134 x71/2 | 16x12 | 23½x19 | 18 | $21\frac{1}{4} \times 17$ |
| 8 x5 | 13½x10 | 11 | $11\frac{3}{4} \times 8\frac{1}{2}$ | 16x14 | 23½ x21 | 18 | 21¼x18¾ |
| 8 x6 | 13½x11 | 11 | $11\frac{3}{4} \times 9\frac{1}{2}$ | | | ۱ ا | |

Flanged Taper Reducers as above or of any other dimensions, will be made to order. Prices on application.

For 125 Pounds Working Pressure

LONG RADIUS ELBOW

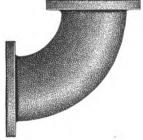


Fig. 726A

BASE ELROW



Fig. 726B

LONG RADIUS ELBOWS

BASE ELBOWS

| | | | | Price | , Еасн | | | | | Price. | EACH |
|----------------|--------------------------------|------------------|----------------------------------|--------------------------|--|----------------|--------------------------------|--------------------------------|---------------|--------------------------|--|
| Size Inches | Center to Face Inches | Radius Inches | Diam. of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | Center to Face Inches | Center to Base Inches | of Flanges | With Faced Flanges | With Faced and Drilled Flanges |
| 4 | 9 | 73/8 | 9 | 14.50 | 18.50 | 4 | 61% | 61/2 | 9 | 12.00 | 15.00 |
| 41/2 | 91/2 | 73/4 | 9!4 | 18.00 | 22.00 | 41/2 | 7 | 634 | 9!4 | 15.00 | 18.00 |
| 5 | 101/4 | 81/2 | 10 | 19.50 | 23.50 | 5 | 71/2 | 7 | 10 | 16.25 | 19.25 |
| 6 | 111/2 | 95% | 11 | 24.00 | 28.00 | 6 | 8 | 71/2 | 11 | 20.00 | 23.00 |
| 7 | 123/4 | 107/8 | $12\frac{1}{2}$ | 32.00 | 39.50 | 7 | 81/2 | 814 | 121/2 | 26.50 | 32.00 |
| 8 | 14 | 12 | 131/2 | 40.00 | 47.50 | 8 | 9 | 834 | 1312 | 33 .59 | 39.00 |
| 9 | 151/4 | 13 | 15 | $^{\circ}52.00$ | 60,00 | 9 | 10 | 91/2 | 15 | 43.50 | 50.00 |
| 10 | 161/2 | 141/8 | 16 | 64.00 | 72.00 | 10 | 11 | 10 | 16 | 53.50 | 60.00 |
| 12 | 19 | 161/2 | 19 | 88.00 | 100.00 | 12 | 12 | 101/2 | 19 | 74.00 | 83.00 |
| 14 | 211/2 | 1878 | 21 | 116.00 | 130.00 | 14 | 14 | $13^{\frac{1}{2}}$ | 21 | 96.00 | 107.00 |
| 15 | $22\frac{3}{4}$ | 20 | 2214 | 144.00 | 160.00 | 15 | 141/2 | 14 | 221/4 | 120.00 | 132.00 |
| 16 | 24 | 2114 | 231_2 | 168.00 | 186.00 | 16 | 15 | 143/4 | $23i_2$ | 140.00 | 153.00 |

Long Radius Elbows of different dimensions from above made to order at a special price.

Prices given on Flanged Base Elbows do not include Facing or Drilling of Base Flanges.



Fig. 726C

Base Tees made to order. Prices on application.

STANDARD COMPANION FLANGES

For 125 Pounds Working Pressure

BACK VIEW SHOWING HUB

SMOOTH FACE

CORRUGATED FACE



Fig. 30A



Fig. 30B

Fig. 30C

16 INCHES AND UNDER

BLIND FLANGES

19 INCHES AND LARGER



Fig. 30D



Fig. 30E

| | | CAST | IRON | MALLEAR | BLE IRON | FERR | OSTEEL | FORGEI | STEEL | BLIND I | FLANGES |
|------|--------|------------------------|---------------------------------|------------------------|---------------------------------|------------------------|---------------------------------|------------------------|---------------------------------|------------------------|---------------------------------|
| | Size | Price Faced Each | Faced and Drilled Each |
| 1 | x 4 | 1.00 | 1.25 | 2.00 | 2.50 | 1.25 | 1.55 | | | | |
| 11/4 | x 41/2 | 1.05 | 1.35 | 2.10 | 2.70 | 1.30 | 1.70 | | | | |
| | c x 5 | 1.10 | 1.40 | 2.20 | 2.80 | 1.35 | 1.75 | | | | |
| 2 | x 6 | 1.20 | 1.50 | 2.40 | 3.00 | 1.50 | 1.90 | 10.40 | 11.00 | 1.40 | 1.70 |
| 21/ | 2x 7 | 1.40 | 2.00 | 2.80 | 4.00 | 1.75 | 2.50 | 11.80 | 13.00 | 1.60 | 2.20 |
| 3 | x 71/2 | 1.60 | 2.25 | 3.20 | 4.50 | 2.00 | 2.80 | 13.70 | 15.00 | 1.85 | 2.50 |
| 31/ | x 81/2 | 1.80 | 2.50 | 3 60 | 5.00 | 2.25 | 3.15 | 17.60 | 19.00 | 2.10 | 2.80 |
| 4 | x 9 | 2.15 | 3.00 | 4.30 | 6.00 | 2.70 | 3.75 | 18.30 | 20.00 | 2.50 | 3.35 |
| 41/ | x 91/4 | 2.50 | 3.35 | 5.00 | 6.70 | 3.15 | 4.20 | 20.30 | 22.00 | 2.90 | 3.75 |
| 5 | x10 | 2.80 | 3.65 | 5.60 | 7.30 | 3.50 | 4.60 | 22.30 | 24.00 | 3.25 | 4.10 |
| 6 | x11 | 3.20 | 4.00 | 6.40 | 8.00 | 4.00 | 5.00 | 25.40 | 27.00 | 3.70 | 4.50 |
| 7 | x121/2 | 4.35 | 5.75 | 8.70 | 11.50 | 5.50 | 7.25 | 27.20 | 32.00 | 5.00 | 6.40 |
| 8 | x131/2 | 5.00 | 6.50 | | 13.00 | 6.25 | 8.15 | 32.00 | 35.00 | 5.75 | 7.25 |
| 9 | x15 | 6.75 | 8.25 | 13.50 | 16.50 | 8.50 | 10.25 | 37.00 | 40.00 | 7.75 | 9.25 |
| 0 | x16 | 7.75 | 9.25 | 15.50 | 18.50 | 9.75 | 11.50 | 45.00 | 48.00 | 9.00 | 10.60 |
| 2 | x19 | 10.50 | 12.50 | 21.00 | 25.00 | 13.25 | 15.75 | 56.00 | 60.00 | 14.00 | 16.00 |
| 4 | x21 | 13.75 | 16.00 | 27.50 | 32.00 | 17.25 | 20.00 | 75.50 | 80.00 | 17.50 | 19.75 |
| 5 | x21 | 18.00 | 21.00 | 36.00 | 42.00 | 22.50 | 26.25 | | | 22.50 | 25.50 |
| 5 | x221/4 | 18.00 | 21.00 | 36.00 | 42.00 | 22.50 | 26.25 | | | 22,50 | 25.50 |
| 6 | x231/2 | 22.50 | 26.00 | 45.00 | 52.00 | 28.00 | 32.50 | | | 28.00 | 31.50 |
| 18 | x25 | 27.50 | 31.00 | 55.00 | 62.00 | 34.50 | 39.00 | | | 33.00 | 36.50 |
| 20 | x271/6 | 30.00 | 34.00 | 60.00 | 68.00 | 37.50 | 42.50 | | | 36,00 | 40.00 |
| 22 | x291/2 | 33.75 | 39.00 | 67.50 | 78.00 | 42.25 | 49.00 | | | 41.00 | 46.00 |
| 24 | x32 | 41.00 | 46.00 | 82.00 | 92.00 | 51.00 | 57.50 | | | 50.00 | 55.00 |

STANDARD REDUCING COMPANION FLANGES

WITH RIBS

For Standard Flanged Valves and Fittings of 125 Pounds Working Pressure

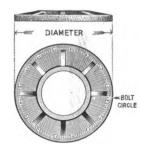


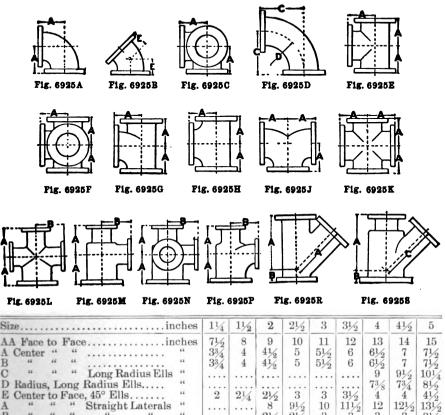
Fig. 31A

| | Price | , Елсн | | Price | , Елсн | | Price, | Елсн |
|---|-------|-------------------------|-------------------------------------|-------|-------------------------|---------------------------------------|--------|-------------------------|
| Size Inches | Faced | Faced and Drilled | Size Inches | Faced | Faced and Drilled | Size Inches | Faced | Faced and Drilled |
| 1½ x 7 | 2.10 | 3.00 | 4 x 12½ | 6.50 | 8.50 | 9 x 21 | 20.00 | 24.00 |
| 2^{2} x 7 | 2.10 | 3.00 | 41/2 x 121/2 | 6.50 | 8.50 | 10 x 21 | 20.00 | 24.00 |
| 1½ x 7½ | 2.40 | 3.35 | 5 x 121% | 6.50 | 8.50 | 12 x 21 | 20.00 | 24.00 |
| $2^{2} \times 7\frac{1}{2}$ | 2.40 | 3.35 | 6 x 12½ | 6.50 | 8.50 | 8 x 22 1/4 | 27.00 | 31.50 |
| $2\frac{1}{2} \times 7\frac{1}{2}$ | 2.40 | 3.35 | 2 x 1313 | 7.50 | 9.75 | $10 \times 22^{1/4}$ | 27.00 | 31.50 |
| $2 \times 8\frac{1}{2}$ | 2.70 | 3.75 | $2\frac{1}{2} \times 13\frac{1}{2}$ | 7.50 | 9.75 | 12×22^{14} | 27.00 | 31.50 |
| $2\frac{1}{2} \times 8\frac{1}{2}$ | 2.70 | 3.75 | $3^{\circ} \times 13^{\circ}$ | 7.50 | 9.75 | 14 x 22 1/4 | 27.00 | 31.50 |
| $3\tilde{\mathbf{x}} \mathbf{x} 8 \hat{\mathbf{x}}$ | 2.70 | 3.75 | 4 x 13½ | 7.50 | 9.75 | $10 \times 23\frac{1}{2}$ | 34.00 | 39.00 |
| 2×9 | 3.25 | 4.50 | 5×13^{12} | 7.50 | 9.75 | 12×23^{12} | 31.00 | 39.00 |
| 2½ x 9 | 3.25 | 4.50 | $6 \times 13\frac{17}{2}$ | 7.50 | 9.75 | 14 x 23½ | 34.00 | 39.00 |
| 3 x 9 | 3.25 | 4.50 | 7 $\times 13\frac{12}{2}$ | 7.50 | 9.75 | $15 \times 23\frac{1}{2}$ | 34.00 | 39.00 |
| $3\frac{1}{2} \times 9$ | 3.25 | 4.50 | 6 x 15 | 10.00 | 12.25 | 12 x 25 | 41.00 | 46.00 |
| $2\frac{1}{2} \times 9\frac{1}{4}$ | 3.75 | 5.00 | 7 x 15 | 10.00 | 12.25 | 14 x 25 | 41.00 | 46.00 |
| 3 x 9½ | 3.75 | 5.00 | 8 x 15 | 10.00 | 12.25 | 15 x 25 | 41.00 | 46.00 |
| $3\frac{1}{2} \times 9^{\frac{1}{4}}$ | 3.75 | 5.00 | 2½ x 16 | 11.50 | 14.00 | 16 x 25 | 41.00 | 46.00 |
| $4 \times 9\frac{1}{4}$ | 3.75 | 5.00 | 3 x 16 | 11.50 | 14.00 | 14 x 27½ | 45.00 | 51.00 |
| 2 x 10 | 4.25 | 5.50 | 3½ x 16 | 11.50 | 14.00 | $15 \times 27 \%$ | 45.00 | 51.00 |
| 2½ x 10 | 4.25 | 5.50 | 4 x 16 | 11.50 | 14.00 | $16 \times 27\frac{1}{2}$ | 45.00 | 51.00 |
| 3 x 10 | 4.25 | 5.50 | 5 x 16 | 11.50 | 14.00 | 18 x 27 1/2 | 45.00 | 51.00 |
| 3½ x 10 | 4.25 | 5.50 | 6 x 16 | 11.50 | 14.00 | $15 \times 29 \frac{1}{2}$ | 50,00 | 58.50 |
| 4 x 10 | 4.25 | 5.50 | 7 x 16 | 11.50 | 14.00 | 16 x 29 1/2 | 50.00 | 58.50 |
| 4½ x 10 | 4.25 | 5.50 | 8 x 16 | 11.50 | 14.00 | $18 \times 29^{1}_{2}$ | 50,00 | 58.50 |
| 2 x 11 | 4.75 | 6.00 | 9 x 16 | 11.50 | 14.00 | $20 \times 29 \frac{1}{2}$ | 50.00 | 58.50 |
| 2½ x 11 | 4.75 | 6,00 | 6 x 19 | 15.75 | 18.75 | 14 x 32 | 61.00 | 70.00 |
| 3 x 11 | 4.75 | 6.00 | 7 x 19 | 15.75 | 18.75 | 16 x 32 | 61.00 | 70.00 |
| 3½ x 11 | 4.75 | 6.00 | 8 x 19 | 15.75 | 18.75 | 18 x 32 | 61.00 | 70.00 |
| 4 x 11 | 4.75 | 6.00 | 9 x 19 | 15.75 | 18.75 | 20 x 32 | 61.00 | 70.00 |
| 4½ x 11 | 4.75 | 6.00 | 10 x 19 | 15.75 | 18.75 | | | • • • • • |
| 5 x 11 | 4.75 | 6.00 | 8 x 21 | 20.00 | 24.00 | · · · · · · · · · · · · · · · · · · · | | • • • • • |

Furnished smooth faced and not drilled, unless otherwise specified.

DIMENSIONS OF STANDARD CAST IRON FLANGED FITTINGS

For Steam Working Pressures up to 125 Pounds



| Size | Sizeinches | | | | | | | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | $4\frac{1}{2}$ | 5 |
|------|------------|------|------|-------------|---------|------|-------|-------|-------|----------------|-------|-------|-------|----------------|-------|
| AA | Face | to | Fac | e | in | ches | 71/2 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| A (| Center | | 66 | | | 64 | 33/4 | 4 | 41/2 | 5 | 51/2 | 6 | 61/2 | 7 | 71/2 |
| В | - 44 | 66 | 66 | | | 66 | 33/4 | 4 | 41% | 5 | 51/2 | 6 | 61/2 | 7 | 71/2 |
| C | 16 | 66 | ** | Long Radio | us Ells | 66 | | | | | | | 9 | 91/2 | 101/4 |
| DI | Radius | . L | ong | Radius Ells | | 66 | | | | | | | 73/8 | 73/4 | 81/2 |
| | | | | e, 45° Ells | | 66 | 2 | 21/4 | 21/2 | 3 | 3 | 31/2 | 4 | 4 | 41/2 |
| A | 44 | 46 | 66 | Straight La | | 44 | | | 8 | 91/2 | 10 | 111/2 | 12 | 121/2 | |
| В | 44 | 46 | 66 | " | 66 | 46 | | | 21/2 | 21/2 | 3 | 3 | 3 | 3 | 31/2 |
| A | 44 | 46 | 44 | Reducing | 66 | 44 | | | | | | | 11 | 11 | 12 |
| В | a | 66 | 66 | ** | 44 | 66 | | | | | | | 2 | 2 | 2 |
| C | 44 | 66 | 66 | ** | 66 | " | | | | | | | 11 | 11 | 12 |
| Size | e | | | | in | ches | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 |
| AA | Face | to | Fac | e | in | ches | 16 | 17 | 18 | 20 | 22 | 24 | 28 | 29 | 30 |
| A (| Center | | ** | | | 44 | 8 | 81/2 | 9 | 10 | 11 | 12 | 14 | 141/2 | 15 |
| В | 44 | 66 | - 64 | | | 66 | 8 | 81/2 | 9 | 10 | 11 | 12 | 14 | 141/2 | 15 |
| C | 44 | 46 | | Long Radi | us Ells | 1.6 | 111/6 | 123/4 | 14 | 151/4 | 161/2 | 19 | 211/2 | 2234 | 24 |
| D | Radius | 3. L | ong | Radius Ells | 3 | 44 | 95/8 | 107/8 | 12 | 13 | 141/8 | 161/6 | 187% | | 211/4 |
| | | | | e, 45° Ells | | 66 | 5 | 51/2 | 51/5 | 6 | 61/2 | 71/2 | 71/2 | 8 | 8 |
| A | 66 | ** | 66 | Straight La | | 44 | 141/2 | 161/2 | 171/2 | 191/6 | 2016 | | 27 | 281/2 | 30 |
| В | 44 | 44 | 44 | " | 44 | 66 | 31/2 | 4 | 41/2 | 41/2 | 5 | 51/2 | 6 | 6 | 61/2 |
| A | 14 | 64 | 66 | Reducing | 66 | 66 | 131/2 | 141/6 | / 4 | 1.4 | 17 | 19 | 21 | 22 | 23 |
| В | 16 | 66 | 66 | " | 66 | 44 | 11/2 | 11/2 | 11/5 | 11/6 | 1 | 1 | 1 | 1 | 1 |
| C | " | " | 66 | " | " | 66 | 131/2 | | 151/2 | -/ 4 | 18 | 201/2 | 23 | 24 | 251/2 |

DIAMETER OF STANDARD

FLANGES AND TEMPLATES FOR DRILLING

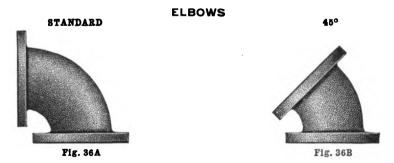
STANDARD AND LOW PRESSURE FLANGED FITTINGS AND FLANGES STANDARD FLANGED GLOBE, ANGLE, GATE VALVES, ETC.

| Size Inches | Diameter of Flanges Inches | Bolt Circle Inches | Number of Bolts | Diameter of Bolts Inches | Length of Bolts for Standard Flanges Inches | Length of Bolts for Low Pressure Flanges Inches |
|--------------------------|----------------------------------|--|--------------------|---|---|---|
| 3/4 | 31/2 | 21/2 | 4 | 3/8 | 11/2 | |
| 1 | 1 4 | 3 ~ | 4 | 8 / 10 / 10 / 10 / 10 / 10 / 10 / 10 / 1 | $\frac{112}{112}$ | |
| $\frac{11_{4}}{11_{2}}$ | 41/2 5 6 7 | 33/8 37/8 | 4 | 7/6 | 11/2 | |
| 11/2 | 5 | 37/8 | 4 | 1/2 | 13/4 | |
| 2 | 6 | i 43 ₄ | 4 | 5,7 | 2 | |
| $\frac{2}{2}\frac{2}{4}$ | 7 | 51/2 | 4 | 58 | 214 | 1 |
| 3 | 71/2 81/2 | 6 | 4 | 5 _B | 212 | |
| 31, | 81/2 | 7 | 4 | 58 | 212 | |
| 4 | 9 | 7½ | 4 | 34 | 234 | |
| 41/2 | 91/4 | 734 | 8 | 34 | 3 | |
| 5 | 10 | 812 | 8 | 3,4 | 21/4/2 21/4/2 21/8/2 23/4 3 3 3 | |
| 6 7 8 | 11 | 914 | 8 | 34 | 3 | |
| 7 | 1212 | 103/ | 8 8 | 34 | 3 | |
| 8 | 13½ | 1134 | 8 | 34 | 31/4 | |
| 9 | 15 | 1314 | 12 | 34 | 31/4 | |
| 10 | 16 | 1414 | 12 | 7/8 | 314 314 314 31 ₂ | |
| 12 | 19 | 17 | 12 | 7/8 | 1 33/ | 31/2 |
| 14 | 21 | 1834 | 12 | 1 | 41/4 | 3 3 3 4 |
| 15 | 2214 2314 25 | 20 | 16 | 1 | 414 | 31/4 |
| 16 | 231/2 | 211/4 | 16 | 1 | 4 1/4 | 4 |
| 18 | 25 | $ \begin{array}{c c} 2234 \\ \hline 25 \end{array} $ | 16 | 11/8 | 434 | 41/4 |
| 20 | 271/2 | 25 | 20 | 118 | 5 ¹ / ₂ | 41/2 |
| 22 | 291/2 | 2714 | 20 | 11/4 | 51/2 | 5 |
| 24 | 32 | 2912 | 20 | 114 | 51/2 | 5 * |
| 26 | 341/4 | 3134 | 24 | 114 | 534 | 5 |
| 28 | 3612 | 34 | 28 | 114 | 6 | 41/2 5 5 5 5 5 51/2 51/2 |
| 30 | 3834 | 36 | 28 | 138 | 61 ₄ 61 ₄ 61 ₄ | 51/2 |
| 32 | 411/2 | 381/2 | 28 | 138 | $\frac{614}{4}$ | 51/2 |
| 34 | 431/2 | 401/2 | 32 | 13.8 | 614 | 51/2 |
| 36 | 4534 | $42\frac{3}{4}$ | 32 | 138 | 61/2 6)/4 | 51 ₂ 6 6 |
| 38 | 481/2 | 4514 | 32 | 11/2 | 6/4 | 6 |
| 40 | 501/2 | 4714 | 36 | 1 1/2 | 7 | 6 |
| 42 | $52\overset{\circ}{\cancel{4}}$ | 491/2 | 36 | $ \begin{array}{c c} 11 \\ 11 \\ 2 \\ 11 \\ 2 \end{array} $ | 7.4 | 61/4 |
| 44 | 5514 | 5134 5034 | 40 | 11/2 | 11/4 | 614 |
| 46 | 57)4 | 5334 | 40 | 11/2 | 714 | 614 614 634 634 |
| 48 | 591/2 | 56 | 44 | 11/2 | 7 % | 03/4 |

Flanges, flanged fittings, valves, etc., are drilled in multiples of four, so that fittings may be made to face in any quarter, and holes straddle center line.



For 250 Pounds Working Pressure



STANDARD

45°

| | | | Price, | ЕАСН | | | | PRICE, | Елсн |
|----------------|--------------------------------|----------------------------------|--------------------------|---|----------------|--|----------------------------------|--------------------------|---|
| Size Inches | Center to Face Inches | Diam. of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | Cen ter to Face Inches | Diam. of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 114 | 41/4 | 5 | 4.75 | 5.75 | 11/4 | 2½ | 5 | 5.25 | 6.25 |
| 11/2 | 41/2 | 6 | 4.75 | 5.75 | 11/2 | 234 | 6 | 5.25 | 6.25 |
| 2 | 5 | 6½ | 4.75 | 5.75 | 2 | 3 | 61/2 | 5.25 | 6.25 |
| $2\frac{1}{2}$ | 51/2 | 7½ | 5.00 | 6.25 | 21/6 | 3½ | 712 | 5.50 | 6.75 |
| 3 | 6 | 81/4 | 5.75 | 7.00 | 3 | 3½ | 81/4 | 6.25 | 7.50 |
| 3⅓ | 614 | 9 | 6.50 | 7.75 | 3½ | 4 | 9 | 7.25 | 8.50 |
| 4 | 7 | 10 | 7.25 | 9.25 | 4 | 412 | 10 | 8.00 | 10.00 |
| 41/2 | 71/2 | 101/2 | 9.00 | 11.00 | 41/2 | 41/2 | 101/2 | 10.00 | 12.00 |
| 5 | 8 | 11 | 9.75 | 11.75 | 5 | 5 | 11 | 10.75 | 12.75 |
| 6 | 8½ | $12\frac{1}{2}$ | 12.00 | 14.00 | 6 | 51/2 | 121/2 | 13.00 | 15.00 |
| 7 | 9 | 14 | 16.00 | 19.75 | 7 | 6 | 14 | 16.00 | 19.75 |
| 8 | 10 | 15 | 20.00 | 23.75 | 8 | 6 | 15 | 20.00 | 23.75 |
| 9 | 1016 | 16 | 26.00 | 30.00 | 9 | 6^{1}_{2} | 16 | 26.00 | 30.00 |
| 10 | 111/2 | 171/2 | 32.00 | 36.00 | 10 | 7 | 1712 | 32.00 | 36.00 |
| 12 | 13 | 20 | 44.00 | 50.00 | 12 | 8 | 20 | 44.00 | 50.0 0 |
| 14 | 141/2 | 221/2 | 58.00 | 65.00 | 14 | 8 | 221/2 | 58.00 | 65.00 |
| 15 | 15 | 231/2 | 72.00 | 80.00 | 15 | 812 | 231/2 | 72.00 | 80.00 |
| 16 | 16 | 25 | 84.00 | 93.00 | 16 | 9 | 25 | 84.00 | 93.00 |
| 18 | 17 | 27 | 108.00 | 118.00 | 18 | 91/2 | 27 | 108.00 | 118.00 |
| 20 | 181⁄2 | 291/2 | 135.00 | 148.00 | 20 | 10 | 291/2 | 135.00 | 148.00 |
| 22 | 20 | 311/2 | 160.00 | 180.00 | 22 | 101/2 | 3112 | 160.00 | 180.00 |
| 24 | 22 | 34 | 200.00 | 220.00 | 24 | 111/2 | 34 | 200.00 | 220.00 |

Larger sizes made to order. Prices on application. Furnished faced only, unless otherwise ordered.

For 250 Pounds Working Pressure

TEES

STANDARD

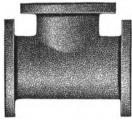


Fig. 37A

REDUCING



Fig. 37B

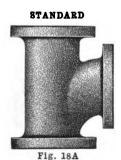
STANDARD

REDUCING Reducing in Run or Branch

| | | | 1 | Pric | E, EACH | | Price | E, EACH |
|------------------|-----------------------------|---------------------------|----------------------------------|--------------------------|---|----------------|--------------------------|---|
| Size Inches | Center to Face Inches | Face to Face Inches | Diameter of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 1½ 1½ 2 | 41/4 | 81/2 | 5 | 7.00 | 8.50 | | | |
| 11/2 | 41/2 | 9 | 6 | 7.00 | 8.50 | | | |
| 2 | 5 | 10 | 61/2 | 7.00 | 8.50 | 2 | 8.00 | 9.50 |
| $\frac{21/2}{3}$ | 51/2 | 11 | 71/2 | 7.25 | 9.00 | 3/2 | 8.25 | 10.00 |
| 3 | 6 | 12 | 6½ 7½ 8¼ 8¼ | 8.25 | 10.00 | 3 | 9.50 | 11.25 |
| 31/2 | 61/2 | 13 | 9 | 9.50 | 11.25 | 3½ | 11.00 | 12.75 |
| 4 | 7 | 14 | 10 | 10.50 | 13.50 | 4 | 12.00 | 15.00 |
| 4½ 5 | 71/2 | 15 | 10½ | 13.00 | 16.00 | 41/2 | 15.00 | 18.00 |
| 5 | 8 | 16 | 11 | 14.25 | 17.25 | 5 | 16.25 | 19.25 |
| 6 7 8 9 | 81/2 | 17 | 12½ | 17.50 | 20.50 | 6 | 20.00 | 23.00 |
| 7 | 9 | 18 | 14 | 23.00 | 28.75 | 7 | 26.50 | 32.00 |
| 8 | 10 | 20 | 15 | 29.00 | 34.75 | 8 | 33.50 | 39.00 |
| | 101/2 | 21 | 16 | 38.00 | 44.00 | 9 | 43.50 | 50.00 |
| 10 | 111/2 | 23 | 171/2 | 46.50 | 52.50 | 10 | 53.50 | 60.00 |
| 12 | 13 | 26 | 20 | 64.00 | 73.00 | 12 | 74.00 | 83.00 |
| 14 | 141/2 | 29 | 221/2 | 84.00 | 95.00 | 14 | 96.00 | 107.00 |
| 15 | 15 | 30 | 23½ | 105.00 | 117.00 | 15 | 120.00 | 132.00 |
| 16 | 16 | 32 | 25. | 122.00 | 135.00 | 16 | 140.00 | 153.00 |
| 18 | 17 | 34 | 27 | 155.00 | 170.00 | 18 | 178.00 | 193.00 |
| 20 | 181/2 | 37 | 291/2 | 195.00 230.00 | 215.00 | 20 | 225.00 | 245.00 |
| 22 | 20 | 40 | $\frac{311}{34}$ | 290.00 | 260.00 320.00 | 22 24 | 265.00 335.00 | 295.00 |
| 24 | 22 | 44 | 94 | 200.00 | 520.00 | 24 | 00.666 | 365.00 |

Larger sizes made to order. Prices on application. Furnished FACED ONLY, unless otherwise ordered.

For 250 Pounds Working Pressure SINGLE SWEEP TEES



STANDARD



Fig. 18B

REDUCING Reducing in Run or Branch

| | | Page | Diameter - | PRICE | , Еасн | | PRICE, EACH | | |
|----------------|-----------------------------|---------------------------|----------------------------------|--------------------------|---|----------------|--------------------------|---|--|
| Size Inches | Center to Face Inches | Face to Face Inches | Diameter of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges | |
| 2 | 5 | 10 | 61/2 | 8.00 | 9.50 | | | •••• | |
| 2½ | $5\frac{1}{2}$ | 11 | 71/2 | 8.25 | 10.00 | 21/2 | 9.50 | 11.25 | |
| 3 | 6 | 12 | 81/4 | 9.50 | 11.25 | 3 | 11.00 | 12.75 | |
| 31/2 | 61/2 | 13 | 9 | 11.00 | 12.75 | 3½ | 12.50 | 14.25 | |
| 4 | 7 | 14 | 10 | 12.00 | 15.00 | 4 | 13.75 | 16.75 | |
| 41/2 | 7½ | 15 | 10½ | 15.00 | 18.00 | 41/2 | 17.25 | 20.25 | |
| 5 | 8 | 16 | 11 | 16.25 | 19.25 | 5 | 18.75 | 21.75 | |
| 6 | 81/2 | 17 | 12½ | 20.00 | 23.00 | 6 | 23.00 | 26.00 | |
| 7 | 9 | 18 | 14 | 26.50 | 32.00 | 7 | 30.00 | 35.50 | |
| 8 | 10 | 20 | 15 | 33.50 | 39.00 | 8 | 38.50 | 44.00 | |
| 9 | 101/2 | 21 | 16 | 43.50 | 50.00 | 9 | 50.00 | 56.50 | |
| 10 | 111/2 | 23 | 17½ | 53,50 | 60.00 | 10 | 61.50 | 68.00 | |
| 12 | 13 | 26 | 20 | 74.00 | 83.00 | 12 | 85.00 | 94.00 | |
| 14 | 141/2 | 29 | 221/2 | 96.00 | 107.00 | 14 | 110.00 | 121.00 | |
| 15 | 15 | 30 | 231/2 | 120.00 | 132.00 | 15 | 138.00 | 150.00 | |
| 16 | 16 | 32 | 25 | 140.00 | 153.00 | 16 | 160.00 | 173.00 | |
| 18 | 17 | 34 | 27 | 178.00 | 193.00 | 18 | 205.00 | 220.00 | |
| 20 | 181/2 | 37 | 29½ | 225.00 | 245.00 | 20 | 258.00 | 278.00 | |
| 22 | 20 | 40 | 31½ | 265.00 | 295.00 | 22 | 305.00 | 335.00 | |
| 24 | 22 | 44 | 34 | 335.00 | 365.00 | 24 | 385.00 | 415.00 | |

Larger sizes made to order. Prices on application.

Furnished faced only, unless otherwise ordered.

Reducing Single Sweep Tees made to order only.

Single Sweep Tees, with the side opening larger than the run, made to order only.

For 250 Pounds Working Pressure

CROSSES

STANDARD

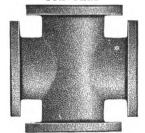


Fig. 38A

REDUCING



Fig. 38B

STANDARD

REDUCING

| | Diameter | | PRICE | , Елси | | Diameter | Price | , Елсн |
|----------------|-------------------------|---------------------------|--------------------------|---|----------------|-------------------------|--------------------------|---|
| Size Inches | of Flanges Inches | Face to Face Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 11/4 | 5 | 81/2 | 9.50 | 11.50 | | | | |
| 11/2 | 6 | 9 | 9.50 | 11.50 | | | •••• | |
| 2 | 61/2 | 10 | 9.50 | 11.50 | 2 | 61/2 | 11.00 | 13.00 |
| . 21/2 | 71/2 | 11 | 10.00 | 12.50 | 21/2 | 71/2 | 11.50 | 14.00 |
| 3 | 81/4 | 12 | 11.50 | 14.00 | 3 | 81/4 | 13.25 | 15.75 |
| 31⁄2 | 9 | 13 | 13.00 | 15.50 | 312 | 9 | 15.00 | 17.50 |
| 4 | 10 | 14 | 14.50 | 18.50 | 4 | 10 | 16.75 | 20.75 |
| 41/2 | 10½ | 15 | 18.00 | 22.00 | 41/2 | 101/2 | 20.75 | 25.00 |
| 5 | 11 | 16 | 19.50 | 23.50 | 5 | 11 | 22.50 | 26.50 |
| 6 | 12½ | 17 | 24.00 | 28.00 | 6 | 121/2 | 27.50 | 31.50 |
| 7 | 14 | 18 | 32.00 | 3 9.50 | 7 | 14 | 37.00 | 45.00 |
| 8 | 15 | 20 | 40.00 | 47.50 | 8 | 15 | 46.00 | 53.50 |
| 9 | 16 | 21 | 52.00 | 60.00 | 9 | 16 | 60.00 | 68.00 |
| 10 | 1712 | 23 | 64.00 | 72.00 | 10 | 1712 | 74.00 | 82.00 |
| 12 | 20 | 26 | 88.00 | 100.00 | 12 | 20 | 100.00 | 112.00 |
| 14 | $22\frac{1}{2}$ | 29 | 116.00 | 130.00 | 14 | 2212 | 132.00 | 146.00 |
| 15 | 2312 | 30 | 144.00 | 160.00 | 15 | 231/2 | 165.00 | 180.00 |
| 16 | 25 | 32 | 168.00 | 186.00 | 16 | 25 | 193.00 | 210.00 |
| 18 | 27 | 34 | 216.00 | 236.00 | 18 | 27 | 248.00 | 268.00 |
| 20 | 2914 | 37 | 270.00 | 296.00 | 20 | 291/2 | 310.00 | 335.00 |
| 22 | 311/2 | 40 | 320.00 | 360.00 | 22 | 311/2 | 370.00 | 410.00 |
| 24 | 34 | 44 | 400.00 | 440.00 | 24 | 34 | 460.00 | 500.00 |

Furnished FACED ONLY, unless otherwise ordered.

These Fittings can be furnished faced as follows: Corrugated, male, female, tongued and grooved.

Reducing crosses made to order only.



For 250 Pounds Working Pressure

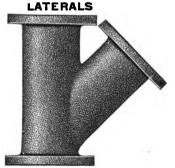


Fig. 39A

STANDARD

REDUCING Reducing in Run or Branch

| | | Center to | | Pri | св, Елсн | | PRICE | , Елсн |
|----------------|-------------------------------------|---------------------------------------|-------------------------------------|--------------------------|---|----------------|--------------------------|---|
| Size Inches | Diameter of Flanges Inches | Face of Run or Outlet Inches | Face to Face of Run Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 2 | 6½ | 9 | 111/2 | 9.50 | 11.50 | | | |
| $2\frac{1}{2}$ | 71/2 | 101/2 | 13 | 10.CO | 12.50 | | | |
| 3 | 81/4 | 11 | 14 | 11.50 | 14.00 | | •••• | |
| 31/2 | 9 | 121/2 | 151/2 | 13.00 | 15.50 | | •••• | |
| 4 | 10 | 131/2 | 161/2 | 14.50 | 18.50 | 4 | 16.75 | 20.75 |
| 41/2 | 101/2 | 141/2 | 18 | 18.00 | 22.00 | 41/2 | 20.75 | 25.00 |
| 5 | 11 | 15 | 181/2 | 19.50 | 23.50 | 5 | 22.50 | 26.50 |
| 6 | 121/2 | 171/2 | 211/2 | 24.00 | 28.00 | 6 | 27.50 | 31.50 |
| 7 | 14 | 18½ | 23 | 32.00 | 39.50 | 7 | 37.00 | 45.00 |
| 8 | 15 | 20 | 25 | 40.00 | 47.50 | 8 | 46.00 | 53.50 |
| 9 | 16 | 21 | 26 | 52.00 | 60.00 | 9 | 60.00 | 68.00 |
| 10 | 17½ | 23 | 281, | 64.00 | 72.00 | 10 | 74.00 | 82.00 |
| 12 | 20 | 261/2 | 321/2 | 88.00 | 100.00 | 12 | 100.00 | 112.00 |
| 14 | 221/2 | 30 | 361/2 | 116.00 | 130.C0 | 14 | 132.00 | 146.00 |
| 15 | 231/2 | 311/2 | 38 | 144.00 | 160.00 | 15 | 165.00 | 180.00 |
| 16 | 25 | 33 | 401/2 | 168.00 | 186.00 | 16 | 193.00 | 210.00 |
| 18 | 27 | 36 | 44 | 216.00 | 236.00 | 18 | 248.00 | 268.00 |
| 20 | 291/2 | 38 | 46½ | 270.00 | 296.00 | | | |
| 22 | 311/2 | 411/2 | 51 | 320.00 | 360.00 | | | |
| 24 | 34 | 441/2 | 541/2 | 400.00 | 440.CO | ٠ ا | | l |

Furnished FACED ONLY, unless otherwise ordered. They can also be furnished, faced as follows; corrugated, male, female, tongued and grooved.

Reducing laterals made to order only.

For 250 Pounds Working Pressure

REDUCING TAPER ELBOWS

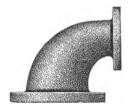


Fig. 6830A

| Size | Diameter of | Bolt Circles | Center to Face - | PRICE | E, EACH |
|----------|-----------------|---------------------------|------------------|------------------|------------------------------|
| Inches | Flanges, Inches | Inches | Inches | Faced Flanges | Faced and Drilled Flanges |
| 3 x 1½ | 81/4 x 6 | 65/8x 41/2 | 6 . | 11.50 | 14.00 |
| 3 x 2 | 81/4 x 61/2 | 65/8x 5 | 6 | 11.50 | 14.00 |
| 3 x 21/2 | 81/4 x 71/2 | 65/8 x 57/8 | 6 | 11.50 | 14.00 |
| 3½x 2½ | 9 x 7½ | 71/4 x 57/8 | 61/2 | 13.00 | 15.50 |
| 3½x 3 | 9 x 81/4 | 71/4 x 65/8 | 61/2 | 13.00 | 15.50 |
| 4 x 2 | 10 x 6½ | 77/8x 5 | 7 2 | 14.50 | 18.50 |
| 4 x 21/2 | 10 x 7½ | 7% x 5% | 7 | 14.50 | 18.50 |
| 4 x 3 | 10 x 81/4 | 77/8x 65/8 | 7 | 14.50 | 18.50 |
| 5 x 2½ | 11 x 7½ | 91/4x 57/8 | 8 | 19.50 | 23.50 |
| 5 x 3 | 11 x 8½ | 914x 65% | 8 | 19.50 | 23.50 |
| 5 x 4 | 11 x10 | 91/4x 77/8 | 7 8 8 8 | 19.50 | 23.50 |
| 6 x 3 | 121/5x 81/4 | 105/8x 65/8 | 81/2 | 24.00 | 28.00 |
| 6 x31/2 | 12½x 9 | 105/8x 71/4 | 81/2 | 24.00 | 28.00 |
| 6 x 4 | 12½x10 | 105/8x 77/8 | 81/2 | 24.00 | 28.00 |
| 6 x 5 | 12½x11 | 105/8x 91/4 | 81/2 | 24.00 | 28.00 |
| 7 x 4 | 14 x10 | 117/8x 77/8 | 9 - | 32.00 | 39.50 |
| 7 x 5 | 14 x11 | 117%x 91/4 | 9 | 32.00 | 39.50 |
| 7 x 6 | 14 x12½ | 1178 x105/8 | 9 | 32,00 | 39.50 |
| 8 x 4 | 15 x10 2 | 13 x 77% | 10 | 40.00 | 47.50 |
| 8 x 5 | 15 x11 | 13 x 91/ | 10 | 40.00 | 47.50 |
| 8 x 6 | 15 x12½ | 13 x105/8 | 10 | 40.00 | 47.50 |
| 8 x 7 | 15 x14 | 13 x117/8 | 10 | 40.00 | 47.50 |
| 10 x 5 | 171/5x11 | 151/4x 91/4 . | 111/2 | 64.00 | 72.00 |
| 10 x 6 | 17½x12½ | 1514x105/8 | 111/2 | 64.00 | 72.00 |
| 10 x 8 | 171/2×15 | 1514x13 | 111/2 | 64.00 | 72.00 |
| 12 x 7 | 20 x14 | 1734x117/8 | 13 | 88.00 | 100.00 |
| 12 x 8 | 20 x15 | $17\frac{3}{4} \times 13$ | 13 | 88.00 | 100.00 |
| 12 x10 | 20 x171/2 | 173/4×151/4 | 13 | 88.00 | 100.00 |
| 14 x10 | 22½x17½ | 20 x1514 | 141/6 | 116.00 | 130,00 |
| 14 x12 | 22½x20 | 20 x1734 | 141/2 | 116.00 | 130,00 |
| 15 x10 | 23½x17½ | 21 x1514 | 15 | 144.00 | 160.00 |
| 15 x12 | 23½x20 | 21 x1734 | 15 | 144.00 | 160.00 |
| 16 x10 | 25 x171/2 | 221/2x151/4 | 16 | 168.00 | 186.00 |
| 16 x12 | 25 x20 2 | 221/2x173/4 | 16 | 168.00 | 186.00 |
| 16 x14 | 25 x22½ | 221/2x20 | 16 | 168,00 | 186,00 |

Flanged taper reducing elbows not listed above will be made to order at a special price.



For 250 Pounds Working Pressure

TAPER REDUCERS



Fig. 296A

| | Size nches | Diameter of Flanges Inches | Face to Face Inches | Bolt Circles Inches | Size Inches | Diameter of Flanges Inches | Face to Face Inches | Bolt Circles Inches |
|----|--------------------|-----------------------------------|---------------------------|--------------------------------------|----------------|-----------------------------------|---------------------------|------------------------------------|
| 3 | x 2 | 81/4x 61/2 | 6 | 65%x 5 | 14x 6 | 22½x12½ | 16 | 20 x105/8 |
| 31 | 2x 21/2 | 9 x 71/2 | 61/6 | 71/4x 57 s | 14x 8 | 22½x15 | 16 | 20 x13 |
| 4 | x 2 | 10 x 6½ | 7 | 77/8x 5 | 14x10 | 22½x17½ | 16 | 20 x15!4 |
| 4 | x 2½ | 10 x 7½ | 7 | 77 8x 578 | 14x12 | 22½x20 | 16 | 20 x173/4 |
| 4 | x 3 | 10 x 81/4 | 7 | 77 8x 65 8 | 15x 8 | 23½x15 | 17 | 21 x13 |
| 5 | x 2 | 11 x 6½ | 8 | 914x 5 | 15x10 | 23½x17½ | 17 | 21 x1514 |
| 5 | x 2½ | 11 x 7½ | 8 | 914x 578 | 15x12 | 23½x20 | 17 | 21 x1734 |
| 5 | x 3 | 11 x 8½ | 8 | 914x 65/8 | 15x14 | 23½x22½ | 17 | 21 x20 |
| 5 | x 4 | 11 x10 | 8 | 914x 778 | 16x 8 | 25 x15 | 18 | 22½x13 |
| 6 | x 3 | 12 x 81/4 | 9 | 105 sx 65 s | 16x10 | 25 x17½ | 18 | 22½x15¼ |
| 6 | $x \ 3\frac{1}{2}$ | 12½x 9 | 9 | 1058x 714 | 16x12 | 25 x20 | 18 | 22½x17¾ |
| 6 | x 4 | 12½ x10 | 9 | 105 8x 77/8 | 16x14 | 25 x22½ | 18 | $22\frac{1}{2}$ x20 |
| 6 | x 5 | 12½x11 | 9 | 105 8x 914 | 18x10 | 27 x17½ | 19 | 24½x15¼ |
| 7 | x 3 | 14 x 8!4 | 10 | 117 8x 65 8 | 18x12 | 27 x20 | 19 | $24\frac{1}{2}$ x $17\frac{3}{4}$ |
| 7 | x 4 | 14 x10 | 10 | 117 sx 77 s | 18x14 | 27 x22½ | 19 | 24½ x20 |
| 7 | x 5 | 14 x11 | 10 | 117 gx 914 | 18 x 16 | 27 x25 | 19 | $24\frac{1}{2}$ x $22\frac{1}{2}$ |
| 7 | x 6 | 14 x12½ | 10 | 1178x1058 | 20x12 | 29½x20 | 20 | 2634 x1734 |
| 8 | x 3 | 15 x 814 | . 11 | 13 x 65 s | 20x14 | 29½x22½ | 20 | 2634 x20 |
| 8 | x 4 | 15 x10 | 11 | 13 x 778 | 20x16 | 29½ x25 | 20 | $26\frac{3}{4}$ x $22\frac{1}{2}$ |
| 8 | x 5 | 15 x11 | 11 | 13 x 914 | 20x18 | 29½x27 | 20 | $26\frac{3}{4}$ x $24\frac{1}{2}$ |
| 8 | x 6 | 15 x12½ | 11 | 13 x105 s | 22x14 | $31\frac{1}{2}$ x $22\frac{1}{2}$ | 22 | $28\frac{3}{4}$ x20 |
| 10 | x 4 | 17½x10 | 12 | 1514x 778 | 22x16 | 31½x25 | 22 | $28\frac{3}{4}$ x $22\frac{1}{2}$ |
| 10 | x 5 | 17½x11 | 12 | 15¼x 9¼ | 22x18 | 31½x27 | 22 | $28\frac{3}{4}$ x $24\frac{1}{2}$ |
| 10 | x 6 | $17\frac{1}{2}$ x $12\frac{1}{2}$ | 12 | 1514×10^{5} s | 22x20 | $31\frac{1}{2}$ x $29\frac{1}{2}$ | 22 | $28\frac{3}{4}$ x $26\frac{3}{4}$ |
| 10 | х 8 | 17½x15 | 12 | 15 ¹ 4 x13 | 24x16 | 34 x25 | 24 | $31\frac{1}{4}$ x $22\frac{1}{2}$ |
| 12 | x 5 | 20 x11 | 14 | 1734x 914 | 24 x 18 | 34 x27 | 24 | $31\frac{1}{4}$ x $24\frac{1}{2}$ |
| 12 | x 6 | 20 x12½ | 14 | 17^{3}_{4} x 10^{5} s | 24x20 | 34 x29½ | 24 | $31\frac{1}{4}$ x $26\frac{34}{4}$ |
| 12 | x 8 | 20 x15 | 14 | $17\frac{3}{4}$ x 13 | 24x22 | 34 x31½ | 24 | 31/4x 2834 |
| 12 | x10 | 20 x17½ | 14 | $17\frac{3}{4} \times 15\frac{1}{4}$ | •••• | | | |

Prices on application.



For 250 Pounds Working Pressure

LONG RADIUS ELBOW

BASE ELBOW



Fig. 22A LONG RADIUS ELBOWS



Fig. 22B

BASE ELBOWS

| | | | | PRICE, | EACH | | | | | PRICE | ЕАСН |
|----------------|--------------------------------|------------------|---------------------------------------|--------------------------|--|----------------|--------------------------------|---|----------------------------|--------------------------|--|
| Size Inches | Center to Face Inches | Radius Inches | Dlam- eter of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges | Size Inches | Center to Face Inches | Center to Face of Base Inches | Diameter of Flanges Inches | With Faced Flanges | With Faced and Drilled Flanges |
| 2 | 61/2 | 51/4 | 6½ | 9.50 | 11.50 | | | · | | •••• | |
| $2\frac{1}{2}$ | 7 | $55\frac{3}{8}$ | 71/2 | 10.00 | 12.50 | | | | ا ا | | |
| 3 | 73/4 | 614 | 81/4 | 11.50 | 14.00 | | | | | | |
| $3\frac{1}{2}$ | 81/2 | 67/8 | 9 | 13.00 | 15.50 | | | | | | |
| 4 | 9 | 73/8 | 10 | 14.50 | 18.50 | 4 | 7 | 7 | 10 | 12.00 | 15.00 |
| 41/2 | 91/2 | 73/4 | 101/2 | 18.00 | 22.00 | 41/2 | 71/2 | 71/4 | 10½ | 15.00 | 18.00 |
| 5 | 101/4 | 81/2 | 11 | 19.50 | 23.50 | 5 | 8 | 71/2 | 11 | 16.25 | 19.25 |
| 5 6 7 | 111/2 | 95/8 | 121/2 | 24.00 | 28.00 | 6 | 81/2 | 8 | 121/2 | 20.00 | 23.00 |
| 7 | 123/4 | 107/8 | 14 | 32.00 | 39.50 | 7 | 9 | 834 | 14 | 26.50 | 32.00 |
| 8 | 14 | 12 | 15 | 40.00 | 47.50 | 8 | 10 | 91/4 | 15 | 33.50 | 39.00 |
| 8 9 | 151/4 | 13 | 16 | 52.00 | 60.00 | 9 | 101/2 | 10 | 16 | 43.5 0 | 50.00 |
| 10 | 161/2 | 141/8 | 171/2 | 64.00 | 72.00 | 10 | 111/2 | 101/2 | 171/2 | 53. 50 | 60.00 |
| 12 | 19 | 161/2 | 20 | 88.00 | 100.00 | 12 | 13 | 11 | 20 | 74.00 | 83.00 |
| 14 | 211/2 | 1878 | 221/2 | 116.00 | 130.00 | 14 | 141/2 | 14 | 221/2 | 96.00 | 107.00 |
| 15 | $22^{3}\sqrt{4}$ | 20 | 231/2 | 144.00 | 160.00 | 15 | 15 | 141/2 | 231/2 | 110.00 | 122.00 |
| 16 | 24 | 211/4 | 25 | 168.00 | 186.00 | 16 | 16 | 1514 | 25 | 140.00 | 153.00 |

Sizes above 16 inches, prices on application.

BASE TEE

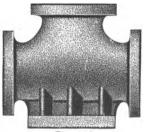


Fig. 22C

Base Tee made to order. Prices on application.



EXTRA HEAVY COMPANION FLANGES

FOR EXTRA HEAVY FLANGED VALVES AND FITTINGS

For 250 Pounds Working Pressure

BACK VIEW SHOWING HUB







Fig. 23A



Fig. 23B

BLIND FLANGES

16 INCHES AND UNDER

17% INCHES AND LARGER



Fig. 23D



F1g. 23E

| | CAST | Iron | FERR | STEEL | CAST | STEEL | Forger | STEEL | BLIND 1 | PLANGES |
|-------------------------------------|------------------------|---------------------------------|------------------------|---------------------------------|------------------------|---------------------------------|------------------------|---------------------------------|------------------------|---------------------------------|
| Size Inches | Price Faced Each | Faced and Drilled Each |
| $\frac{1}{1} \times 4\frac{1}{2}$ | 1.00 | 1.25 | 1.25 | 1.55 | 5.00 | 5.50 | 7.50 | 8.00 | | |
| 1!4x 5 | 1.05 | 1.35 | 1.30 | 1.70 | 5.40 | 6.00 | 8.40 | 9.00 | | |
| $1\frac{1}{2}$ x 6 | 1.10 | 1.40 | 1.35 | 1.75 | 5,90 | 6.50 | 9.40 | 10.00 | | |
| $2 \times 6\frac{1}{2}$ | 1.20 | 1.50 | 1.50 | 1.90 | .6.90 | 7.50 | 10.40 | 11.00 | 1.40 | 1.70 |
| $2\frac{1}{2} \times 7\frac{1}{2}$ | 1.40 | 2.00 | 1.75 | 2.50 | 7.30 | 8.50 | 11.80 | 13.00 | 1.60 | 2.20 |
| $3 \times 81_4$ | 1.60 | 2.25 | 2.00 | 2.80 | 8.70 | 10.00 | 13.70 | 15.00 | 1.85 | 2.50 |
| $3\frac{1}{2} \times 9$ | 1.80 | 2.50 | 2.25 | 3,15 | 12.10 | 13.50 | 17.60 | 19.00 | 2.10 | 2.80 |
| 4 x10 | 2.15 | 3.00 | 2.70 | 3.75 | 14.80 | 16.50 | 18.30 | 20.00 | 2.50 | 3.35 |
| $4\frac{1}{2} \times 10\frac{1}{2}$ | | 3.35 | 3.15 | 4.20 | 15.80 | 17.50 | 20.30 | 22.00 | 2.90 | 3.75 |
| 5×11 | 2.80 | 3.65 | 3.50 | 4.60 | 16.80 | 18.50 | 22.30 | 24.00 | 3, 25 | 4.10 |
| 6 $x12\frac{1}{2}$ | 3.20 | 4.00 | 4 00 | 5.00 | 20.40 | 22.00 | 25.40 | 27.00 | 3.70 | 4.50 |
| 7 x14 | 4.35 | 5.75 | 5.50 | 7.25 | 24.70 | 27.50 | 27.20 | 32.00 | 5.00 | 6.40 |
| 8 x15 | 5.00 | 6.50 | 6.25 | 8.15 | 27.00 | 30.00 | 32.00 | 35.00 | 5.75 | 7.25 |
| 9 x16 | 6.75 | 8.25 | 8.50 | 10.25 | 29.50 | 32.50 | 37.00 | 40.00 | 7.75 | 9.25 |
| $10 \ x17\frac{1}{2}$ | 7.75 | 9.25 | 9.75 | 11.50 | 34.50 | 37.50 | 45.00 | 48.00 | 9.00 | 10.60 |
| 12 x20 | 10.50 | 12.50 | 13.25 | 15.75 | 46.00 | 50.00 | 56.00 | 60.00 | 14.00 | 16.00 |
| $14 \text{ x} 22\frac{1}{2}$ | | 16.00 | 17.25 | 20.00 | 55.50 | 60.00 | 75.50 | 80.00 | 17.50 | 19.75 |
| 15 x23½ | | 21.00 | 22.50 | 26.25 | 64.00 | 70.00 | 84.00 | 90.00 | 22.50 | 25.50 |
| 16 x25 | 22.50 | 26.00 | 28.00 | 32.50 | 7 8. 0 0 | 85.00 | 93.00 | 100.00 | 28.00 | 31.50 |
| 18 x27 | 27.50 | 31.00 | 34.50 | 39.00 | 98.00 | 105.00 | 118.00 | 125.00 | 33.00 | 36.50 |
| 20 x29½ | | 34.00 | 37.50 | 42.50 | 117.00 | 125.00 | 142.00 | 150.00 | 36.00 | 40.00 |
| $22 \times 31\frac{1}{2}$ | 33.75 | 39.00 | 42.25 | 49.00 | 140.00 | 150.00 | 165.00 | 175.00 | 41.00 | 46.00 |
| 24 x34 | 41.00 | 46.00 | 51.00 | 57.50 | 165.00 | 175.00 | 200.00 | 210.00 | 50.00 | 55.00 |
| | | | | | | | | | | |

EXTRA HEAVY REDUCING COMPANION FLANGES

WITH RIBS

FOR EXTRA HEAVY FLANGED VALVES AND FITTINGS
For 250 Pounds Working Pressure

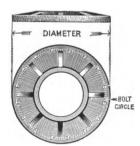


Fig. 6831A

| | PRICE | , Еасн | | Рвісе | EACH | | PRICE | , Еасн |
|-------------------------------------|-------|-------------------------|----------------------------------|-------|-------------------------|----------------|-------|-------------------------|
| Size Inches | Faced | Faced and Drilled | Size Inches | Faced | Faced and Drilled | Size Inches | Faced | Faced and Drilled |
| 1½x 7½ | 2.10 | 3.00 | 4 x12½ | 4.75 | 6.00 | 10x20 | 15.75 | 18.75 |
| $2 \times 7\frac{1}{2}$ | 2.10 | 3.00 | $4\frac{1}{2}$ x $12\frac{1}{2}$ | 4.75 | 6.00 | 8x22½ | 20.00 | 24.00 |
| $1\frac{1}{2} \times 8\frac{1}{4}$ | 2.40 | 3.35 | 5 x121/2 | 4.75 | 6.00 | 9x22½ | 20.00 | 24.00 |
| $2[x 8]_4$ | 2.40 | 3.35 | 4½x14 | 6.50 | 8.50 | $10x22^{1}$ | 20.00 | 24.00 |
| 2½ x 8¼ | 2.40 | 3.35 | 5 x14 | 6.50 | 8.50 | 12x2212 | 20.00 | 24.00 |
| 2 x 9 | 2.70 | 3.75 | 6 x14 | 6.50 | 8.50 | 8x231/2 | 27.00 | 31.50 |
| 2½x 9 | 2.70 | 3.75 | 3 x15 | 7.50 | 9.75 | 10x2312 | 27.00 | 31.50 |
| 3 x 9 | 2.70 | 3.75 | 3½x15 | 7.50 | 9.75 | 12x23½ | 27.00 | 31.50 |
| 2 x10 | 3.25 | 4.50 | 4 x15 | 7.50 | 9.75 | 14x23½ | 27.00 | 31.50 |
| 2½x10 | 3.25 | 4.50 | 5 x15 | 7.50 | 9.75 | 10x25 | 34.00 | 39.00 |
| 3 x10 | 3.25 | 4.50 | 6 x15 | 7.50 | 9.75 | 12x25 | 34.00 | 39.00 |
| 3½x10 | 3.25 | 4.50 | 7 x15 | 7.50 | 9.75 | 14x25 | 34.00 | 39.00 |
| 2 x10½ | 3.75 | 5.00 | 4 x16 | 10.00 | 12.25 | 15x25 | 34.00 | 39.00 |
| $2\frac{1}{2} \times 10\frac{1}{2}$ | 3.75 | 5.00 | 5 x16 | 10.00 | 12.25 | 12x27 | 41.00 | 46.00 |
| 3 x10½ | 3.75 | 5.00 | 6 x16 | 10.00 | 12.25 | 14x27 | 41.00 | 46.00 |
| 31/2 x 101/2 | 3.75 | 5.00 | 7 x16 | 10.00 | 12.25 | 15x27 | 41.00 | 46.00 |
| 4 x10½ | 3.75 | 5.00 | 8 x16 | 10.00 | 12.25 | 16x27 | 41.00 | 46.00 |
| 2 x11 | 4.25 | 5.50 | 5 x17½ | 11.50 | 14.00 | 14x29½ | 45.00 | 51.00 |
| 2½x11 | 4.25 | 5.50 | $6 \times 17\frac{1}{2}$ | 11.50 | 14.00 | 15x29½ | 45.00 | 51.00 |
| 3 x11 | 4.25 | 5.50 | 7 x17½ | 11.50 | 14.00 | 16x29½ | 45.00 | 51.00 |
| $3\frac{1}{2} \times 11$ | 4.25 | 5.50 | 8 x17½ | 11.50 | 14.00 j | 18x291/2 | 45.00 | 51.00 |
| 4 x11 | 4.25 | 5.50 | 9 x17½ | 11.50 | 14.00 | 16x31½ | 50.00 | 58.50 |
| 4½x11 | 4.25 | 5.50 | 6 x20 | 15.75 | 18.75 | 18x31½ | 50.00 | 59.50 |
| $2 \times 12\frac{1}{2}$ | 4.75 | 6.00 | 7 x20 | 15.75 | 18.75 | 20x31½ | 50.00 | 58.50 |
| $2\frac{1}{2}$ x $12\frac{1}{2}$ | 4.75 | 6.00 | 8 x20 | 15.75 | 18.75 | 18x34 | 61.00 | 70.00 |
| $3 x12\frac{1}{2}$ | 4.75 | 6.00 | 9 x20 | 15.75 | 18.75 | 20x34 | 61.00 | 70.00 |

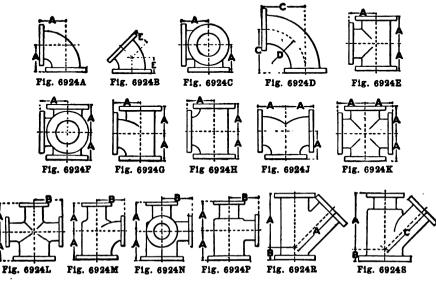
These flanges will always be the same thickness as the regular companion flanges of corresponding outside diameters, and drilled to the template corresponding to outside diameter unless otherwise ordered.



DIMENSIONS OF EXTRA HEAVY FLANGED FITTINGS

CAST IRON. FERROSTEEL OR CAST STEEL

For Steam Working Pressures up to 250 Pounds



| Siz | в | | | | | inches | 11,4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 |
|----------------------|--------|------|-----|--------------|--------|--------|-----------------|-----------------|-----------------|-------|-----------------|-----------------|-------|-----------------|-------|
| AA | -Face | to | Fac | е | | inches | 81/2 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| A-(| Center | r " | " | | | 64 | 414 | 41/2 | 5 | 51/2 | 6 | 61/2 | 7 | 71/2 | 8 |
| В | ** | " | " | | | 44 | 414 | 41/2 | 5 | 51/2 | 6 | 61.2 | 7 | 71/3 | 8 |
| \mathbf{C} | 44 | 44 | 64 | Long Radio | ıs Ell | s " | | | 61/2 | 7 - | 73/4 | 81/2 | 9 | $9\frac{1}{2}$ | 101/4 |
| D-I | Radiu | s. L | ong | Radius Ells. | | " | | | $5\frac{1}{4}$ | 55% | 614 | 67.8 | 73/8 | $7\frac{3}{4}$ | 813 |
| | | | | e, 45° Ells | | " | 216 | 234 | 3 | 31/3 | 31/2 | 4 | 41/3 | 41/3 | 5 |
| A | 66 | " | " | Straight L | | ls " | | | 9 | 101/3 | 11 | 121/2 | 131/3 | 141/3 | 15 |
| В | 44 | " | " | " | 64 | 44 | | | $2\frac{1}{2}$ | 21/2 | 3 | 3 ~ | 3 1 | 31/3 | 31/2 |
| Ā | 44 | " | " | Reducing | 4.4 | " | | | | 2 | | | 12 | 121/3 | 131/2 |
| В | " | " | " | " | 44 | 66 | | | | | | | 2 | 213 | 21/2 |
| C | 44 | 66 | 46 | ** | 44 | • 6 | | | | | | | 13 | $13\frac{1}{2}$ | 141/2 |
| Siz | θ | | | | | inches | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 15 | 16 |
| \overline{AA} | -Face | to | Fac | е | | inches | 17 | 18 | 20 | 21 | 23 | 26 | 29 | 30 | 32 |
| A-(| Center | ۳" | " | | | 66 | 81/2 | 9 | 10 | 101/2 | $11\frac{1}{2}$ | 13 | 141/2 | | 16 |
| \mathbf{B} | " | 66 | " | | | | 81/2 | 9 | 10 | 101/2 | 111/2 | 13 | 141/2 | 15 | 16 |
| C | " | " | " | Long Radiu | ıs Ell | s " | 111/2 | 1234 | 14 | 1514 | 1613 | 19 | | 2234 | 24 |
| D-I | Radiu | s, L | ong | Radius Ells. | | " | 95 8 | 107/8 | 12 | 13 | 141% | 161/2 | 1878 | 20 | 2114 |
| $\mathbf{E} \cdot 0$ | Center | rto | Fac | e, 45° Ells | | " | 51/2 | 6 | 6 | 61/2 | 7 | ⊟8 [°] | 8 | 81/2 | |
| A | 46 | 64 | 66 | Straight L | atera | ls " | 1715 | 1816 | 20 | 21 | 23 | 261/2 | 30 | $31^{1/2}$ | |
| В | 44 | 66 | " | " | " | 46 | 4 | 41/2 | 5 | 5 | 51/9 | 6 ~ | 61/2 | | |
| A | 44 | " | ** | Reducing | 44 | " | 141/2 | $15\frac{1}{2}$ | $17\frac{1}{2}$ | 181/2 | 2013 | 231/9 | | | 29 |
| \mathbf{B} | 66 | 46 | ** | " | ** | 44 | 21/2 | 21/2 | $2\sqrt{2}$ | | | 21/2 | | 21/3 | 3 |
| C | 66 | " | 66 | 44 | " | 44 | $15\frac{1}{2}$ | | 181/2 | | _ (* | A 4 5 7 | 000 7 | $2\overline{8}$ | 301/2 |

DIAMETER OF EXTRA HEAVY

FLANGES AND TEMPLATES FOR DRILLING

EXTRA HEAVY FLANGED VALVES, FITTINGS, AND FLANGES

For 250 Pounds Working Pressure

| Size Inches | Diameter of Flanges Inches | Bolt Circle Inches | Number of Bolts | Size of Bolts Inches | Length of Bolts Inches |
|----------------|----------------------------------|----------------------------|--------------------|----------------------------|------------------------------|
| 114 | 5 | 334 | 4 | 1/2 | 21/4 |
| 11/2 | 6 | 41/2 | 4 | 5/8 | 21/2 |
| 2 | 61/2 | 5 | 4 | 5⁄8 | 21/2 |
| $2\frac{1}{2}$ | 71⁄2 | $5\frac{7}{8}$ | 4 | 3⁄4 | 3 |
| 3 | 81/4 | $6\frac{5}{8}$ | 8 | 5/8 | 3 |
| $3\frac{1}{2}$ | 9 | 71/4 | 8 | 5/8 | 31/4 |
| 4 | 10 | 7 7/8 | 8 | 3⁄4 | 31/2 |
| 41/2 | 101/2 | 81/2 | 8 | 3⁄4 | 31/2 |
| 5 | 11 | 91/4 | 8 | 3⁄4 | 334 |
| 6 | $12\frac{1}{2}$ | 105 ś | 12 | 34 | 334 |
| 7 | 14 | 117/8 | 12 | 7⁄8 | 4 |
| 8 | 15 | 13 | 12 | 7∕8 | 41/4 |
| 9 | 16 | 14 | 12 | 7/8 | 41/2 |
| 10 | 171/2 | 151/4 | 16 | 7 ∕s | 434 |
| 12 | 20 | 173⁄4 | 16 | 7 ∕8 | 5 |
| 14 | 221/2 | 20 | 20 | ₹8 | 51/4 |
| 15 | $23\frac{1}{2}$ | 21 | 20 | 1 | 51/2 |
| 16 | 25 | $22\frac{1}{2}\frac{2}{2}$ | 20 | 1 | 534 |
| 18 | 27 | 241/2 | 24 | 1 | 6 |
| 20 | $29\frac{1}{2}$ | $26^{3}4$ | 24 | 118 | 61/2 |
| 22 | 311/2 | 2834 | 28 | 118 | 634 |
| 24 | 34 | 3114 | 28 | 118 | 7 |

Flanges, Flanged Fittings, Valves, etc., are drilled in multiples of four, so that fittings may be made to face in any quarter and holes straddle center-line.

We will drill Fittings, Valves, etc., to any other Template desired, but would advise that the above Extra Heavy Template be used.



PRICE LIST FOR DRILLING

STANDARD, LOW PRESSURE, MEDIUM AND EXTRA HEAVY FLANGED VALVES AND FITTINGS

| | | OR DRILLING S PRESSURE VA | TANDARD AND | Ext | FOR DRILLING | |
|--------------------------------|--------------------------------------|------------------------------|--|---|---|-----------------|
| Size Inches | With Two Flanges Except Angle Valves | Angle Valves | Cross Valves and Cross Safety Valves | With Two Flanges Except Angle Valves | Angle Valves | Cross Valves |
| 34 | .60 | 1.00 | 1.20 | | •••• | |
| 1 | .60 | 1.00 | 1.20 | .60 | 1.00 | •••• |
| 11/4 | .60 | 1.00 | 1.20 | .60 j | 1.00 | • • • • |
| 1½ 1½ 2 2½ 3 3½ | .60 | 1.00 | 1.20 | .60 | 1.00 | |
| 2 | .75 | 1.25 | 1.50 | .75 | 1.25 | 1.50 |
| 21/9 | .75 | 1.25 | 1.50 | .75 | 1.25 | 1.50 |
| 3 - | .75 | 1.25 | 1.50 | .75 | 1.25 | 1.50 |
| 31/4 | 1.00 | 1.50 | 2.00 | 1.00 | 1.50 | 2.00 |
| 4 | 1.25 | 1.75 | 2.50 | 1.25 | 1.75 | 2.50 |
| 4½ 5 6 7 | 1.50 | 2.00 | 3.00 | 1.50 | 2.00 | 3.00 |
| 5 🗂 | 1.50 | 2.00 | 3.00 | 1 50 | 2.00 | 3.00 |
| 6 | 1.75 | 2.50 | 3.50 | 1.75 | 2.50 | 3.50 |
| 7 | 2.25 | 3.00 | 4.50 | 2.25 | 3.00 | 4.50 |
| 8 9 | 2.25 | 3.00 | 4.50 | 2.25 | 3.00 | 4.50 |
| 9 | 2.50 | 3.50 | 5.00 | 2.50 | 3.50 | 5.00 |
| 10 | 2.50 | 3.50 | 5.00 | 2.50 | 3.50 | 5.00 |
| 12 | 3.50 | 5.00 | 7.00 | 3.50 | 5.00 | 7.00 |
| 14 | 4.00 | 6.00 | | 4.00 | 6.00 | 8.00 |
| 15 | 4.50 | 6.50 | 1 | 4.00 | 6.00 | 8.00 |
| 16 | 5.00 | 7.00 | | 5.00 | 7.00 | |
| 18 | 6.00 | 10.00 | | 6.00 | 1.00 | |
| 20 | 7.50 | 12.00 | | 7.50 | | |
| 22 | 9.00 | 14.00 | | 9.00 | | |
| 24 | 10 00 | 16.00 | '''' | 10.00 | | |
| 2 6 | 11.00 | 18.00 | | 10.00 | • | •••• |
| 28 | 12.00 | 20.00 | | l l | •••• | •••• |
| 30 | 12.00 | 22.00 | | 12.00 | | |
| 30 32 | 12.00 | 22.00 | | | | |
| 34 | 14.00 | 24.00 | | | | |
| 36 | 14.00 | 24.00 | | '''' | •••• | |
| 42 | 25.00 | | | | •••• | |
| 48 | 30.00 | | :::: | :::: | | •••• |

EXTRA NET PRICES FOR ATTACHING COMPANION FLANGES TO STANDARD FLANGED FITTINGS AND VALVES

| | Price | ЕАСН | | Price | Еасн |
|-------------------|--|--|----------------|--|--|
| Size Inches | For Bolting Com- panion Flanges to Fittings Single Flange | Wooden Protectors Bolted on with Two Bolts | Size Inches | For Bolting Com- panion Flanges to Fittings Single Flange | Wooden Protec- tors Bolted on with Two Bolts |
| 11/4 | .10 | .20 | 6 | .15 | .25 |
| 1½ 1½ | .10 | .20 | 7 | .15 | .30 |
| 2 | .10 | .20 | 8 | .15 | .30 |
| 21/2 | .10 | .20 | 9 | .20 | .30 |
| 3 - | .10 | .25 | 10 | .20 | .35 |
| 21/2 3 31/2 | .10 | .25 | 12 | .20 | .35 .35 |
| 4 | .10 | .25 | 14 | .20 | .40 |
| 41/2 | .15 | .25 | 15 | .25 | .40 |
| 5 ~ | .15 | .25 | 16 | .25 | .45 |

Bolts and Gaskets not included in above prices. Spot Facing Bolt Holes 5 cents net, extra, for each hole.

CORRUGATED SOLID COPPER GASKETS







Fig. 959B

| Size Inches | Price | Size Inches | Price | Size Inches | Price | Size Inches | Price | Size Inches | Price |
|--|-------|-----------------|------------|--------------------|-------|----------------------|-------|----------------|--------------|
| 1/6 | .004 | 47/8 | .37 | 131/2 | 2.86 | 231/4 | 8.49 | 33 | 17.11 |
| 1/2 2/16 | .005 | 5 | .39 | 1334 | 2.97 | 231/3 | 8.67 | 331/4 | 17.37 |
| 5% | .006 | 51/8 | .41 | 14 | 3.08 | 233/4 | 8.86 | 331/2 | 17.63 |
| 112 | .007 | 51/4 | .43 | $14\frac{1}{4}$ | 3.19 | 24 | 9.05 | 3334 | 17.89 |
| 3/4 | .009 | 53/8 | .45 | 141/2 | 3.30 | 241/4 | 9.24 | 34 | 18.16 |
| 5/8 11/16 3/4 13/16 7/8 15/16 | .01 | 51/2 | .48 | $14\frac{3}{4}$ | 3.42 | 241/2 | 9.43 | 3414 | 18.43 |
| 7/8 | .012 | 55 🖁 | .50 | 15 | 3.53 | 2434 | 9.62 | 341/2 | 18.70 |
| 15/6 | .014. | 534 | .52 | 1514 | 3.65 | 25 | 9.82 | 3434 | 18.97 |
| 1 | .016 | 534 578 | .54 | 151/3 | 3.77 | 251/4 | 10.01 | 35 | 19.24 |
| 11/8 | .02 | ∥ 6 ∣ | .57 | $15\frac{3}{4}$ | 3.90 | 251/2 | 10.21 | 351/4 | 19.52 |
| $\frac{1}{1}\frac{1}{8}$ $\frac{1}{4}$ | .025 | 61/4 | .61 | 16 | 4.02 | $ 25\sqrt[3]{4} $ | 10.42 | 3516 | 19.80 |
| $1\frac{3}{8}$ | .03 | 61/2 | .66 | 16!4 | 4.15 | 26 | 10.62 | 3534 | 20.08 |
| $\frac{11/2}{15/8}$ | .035 | $6\frac{3}{4}$ | .66 .72 | 161/2 | 4.28 | 261/4 | 10.82 | 36 | 20.36 |
| 15/8 | .04 | 7 | 77 | 163/4 | 4.41 | 261/2 | 11.03 | 3614 | 20.64 |
| 13/4 | .05 | 71/4 | .83 .88 | 17 | 4.54 | $26\bar{34}$ | 11.24 | 361/6 | 20.93 |
| $1\frac{7}{8}$ | .055 | $7\frac{1}{2}$ | .88 | 1714 | 4.67 | 27 | 11.45 | 3634 | 21.21 |
| 2 | .06 | 73/4 | .94 | $ 17\frac{1}{2}$ | 4.81 | 271/4 | 11.66 | 37 | 21.50 |
| $2\frac{1}{8}$ | .07 | 8 | 1.01 | $173\frac{7}{4}$ | 4.95 | 271/2 | 11.88 | 371/4 | 21.80 |
| $2\frac{1}{4}$ | .08 | 814 | 1.07 | 18 | 5.09 | $27\sqrt[3]{4}$ | 12.10 | 371/2 | 22.09 |
| $2\frac{3}{8}$ | .09 | 81/2 | 1.13 | 181/4 | 5.23 | 28 | 12.32 | 3734 | 22.38 |
| $2\frac{1}{2}$ | .10 | 834 | 1.20 | 181/2 | 5.38 | 281/4 | 12.54 | 38 | 22.68 |
| 25_{8}^{7} | .11 | 9 | 1.27 | $18\frac{3}{4}$ | 5.52 | 281/2 | 12.76 | 3814 | 22.98 |
| 23/4 | . 12 | 914 | 1.34 | 19 | 5.67 | 2834 | 12.98 | 381/2 | 23.28 |
| 27/8 | .13 | $91/_{2}$ | 1.42 | 1914 | 5.82 | 29 | 13.21 | 3834 | 23.59 |
| 3 | .14 | $93\frac{7}{4}$ | 1.49 | 191/2 | 5.97 | 291/4 | 13.44 | 39 | 23.89 |
| 318 | .15 | 10 | 1.57 | 1934 | 6.13 | 291/2 | 13.67 | 391/4 | 24.20 |
| 31/4 | .17 | 10!4 | 1.65 | 20 | 6.28 | 2934 | 13.90 | 391/2 | 24.51 |
| 33/8 | .18 | 101/2 | 1.73 | 2014 | 6.44 | 30 | 14.14 | 3934 | 24.82 |
| $3\frac{1}{2}$ | .19 | 1034 | 1.82 | 201/2 | 6.60 | 301/4 | 14.37 | 40 | 25.13 |
| 35.8 | .21 | 11 | 1.90 | 2034 | 6.76 | 301/2 | 14.61 | 4014 | 25.45 |
| 33/4 | .22 | 111/4 | 1.99 | 21 | 6.93 | 303/4 | 14.85 | 401/2 | 25.77 |
| 37/8 | .24 | 111/2 | 2.08 | 2114 | 7.09 | 31 | 15.10 | 4034 | 26.08 |
| 4 | .25 | 113/4 | 2.17 | 211/2 | 7.26 | 3114 | 15.34 | 41 | 26.41 |
| 41/8 | .27 | 12 | 2.26 | 2134 | 7.43 | 311/2 | 15.59 | 411/4 | 26.73 |
| 414 | .28 | 121/4 | 2.36 | 22 | 7.60 | 3134 | 15.83 | 411/2 | 27.05 |
| 43 8 | .30 | 121/2 | 2.45 | 221/4 | 7.78 | 32 | 16.08 | 4134 | 27.38 |
| 41/2 | .32 | 1234 | 2.55 | 221/2 | 7.95 | 321/4 | 16.34 | •••• | • • • • • |
| 45.8 | .34 | 13 | 2.65 | 2234 | 8.13 | 321/2 | 16.59 | •••• | •••• |
| 434 | .35 | 1314 | 2.76 | 23 | 8.31 | $ 323\frac{7}{4} $ | 16.85 | <u> </u> ' | |

Prices given are for solid gaskets; the difference between the price of outside and inside diameters will be the price of the required gasket. Thus, the list of an 8-inch gasket is 1.01; the list of a 6-inch is .57; therefore, the list on a 6×8 -inch gasket would be .44 (1.01 - .57 = .44).

Prices of elliptical and rectangular gaskets, 2 cents per square inch of actual surface.

HOOK AND EXPANSION PLATES

CAST IRON HOOK PLATE

SINGLE HOOK

STEEL HOOK PLATE









CAST IRON HOOK PLATES

| Nu | Number of Hooks | | | | | 1 | 2 | 3 | 4 | 5 | 6 | | | |
|----|--------------------|-----|-------|---------------------|-----------|----------------|-------------|--------------|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|
| " | 1 1½ 1½ 2 | í " | Pipe, | 2½ 3 3½ 4½ | ins. " | . Between " | Center " | rs.each " | .09 .10 .15 .22 | .18 .21 .28 .43 | .23 .27 .43 .65 | .26 .32 .58 .90 | .32 .41 .72 1.15 | .38 .52 .88 1.35 |

STEEL HOOK PLATES

| Number of Hooks | | | | 1 | 2 | 3 | 4 | 5 | 6 |
|--|--------------|--------|-------------|-------------------|-------------------|--------------------------|--------------------------|-------------------|-------------------|
| For 34 in. Pipe, 2 " 1 " " 21/2 " 11/4 " " 31/4 " 11/4 " " 31/4 | ins. Between | Center | s.each " | .08 .09 .10 | .16 .18 .21 | .21 .23 .27 .43 | .24 .26 .32 .58 | .28 .32 .41 | .34 .38 .52 |

BEAM HOOK



Pig. 710D

EXPANSION HOOK PLATE



Fig. 710E

BEAM HOOKS, LONG SHANK

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 1½ | 2 | 21/2 | 3 |
|------------|-----|-----|-----|------|-----|-----|------|-----|
| Priceeach | .13 | .15 | .18 | .22 | .24 | .35 | .65 | .90 |

EXPANSION HOOK PLATES

| Number of Hooks | | | | | 1 | 2] | 3 | 4 | 5 | 6 | | |
|-------------------------------------|------|--|------------------|-------------------|--------|--------|-------------------|--------------------------|--------------------------|---------------------------|---------------------------|----------------------------|
| For 1 in. 1 " 11/4 " " 11/2 " " 2 " | Pipe | 3 3 3 ¹ / ₂ 4 ¹ / ₂ | ins.] " " | Between " " | Center | s.each | .15 .17 .25 | .25 .27 .40 .60 | .35 .40 .60 .85 | .50 .60 .75 1.00 | .60 .70 .90 1.35 | .70 .80 1.00 1.55 |

When Hook Plates are ordered, specifying a greater number of hooks than listed above, we will send two; for instance, an order calling for 1x8 hook plates we will send two 1x4 hook plates.



PIPE HOOKS AND STRAPS

GAS PIPE HOOKS

SOIL PIPE HOOK

TINNED STRAPS



Fig. 712A

Fig. 712B



WROUGHT IRON GAS PIPE HOOKS

| Sizeinches | 1/4 | | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|----------------------|-----|------|-----|-----|------|------|------|------|
| Priceper 100 | .45 | .55 | .65 | .80 | 1.00 | 1.30 | 1.60 | 2.00 |
| Weight per 100pounds | | 11/4 | 134 | 3 | 334 | 6 | 6 | 914 |

WROUGHT IRON SOIL PIPE HOOKS

| Sizeinches | 2 | 3 | 4 | 5 | 6 | 8 |
|------------|-----|-----|-----|-----|-----|------|
| Priceeach | .08 | .10 | .12 | .15 | .20 | . 40 |

TINNED PIPE STRAPS

| Sizeinches | 14 | 3/8 | $\frac{1}{2}$ | 3/4 | 1 | 114 | 11/2 | 2 |
|----------------------|------|------|---------------|------|----|------|------|-------|
| Priceper pound | .30 | .30 | .30 | .30 | 30 | .30 | .30 | .30 |
| Weight per 100pounds | 11/2 | 11/4 | 21/2 | 31/2 | 5 | 73/4 | 10 | 111/2 |

WIRE PIPE HOOK



SPRINKLER CLIP

Fig. 712D

Fig. 712E

GALVANIZED STEEL WIRE PIPE HOOKS

| Pipe Size | LENGTH OF HOOK, INCHES. AND PRICE PER HUNDRED | | | | | | | | | | | | | |
|----------------|---|------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|--|
| Inches | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | | | | | | |
| 3.8 | 5.10 | 5.60 | 6.30 | 7.00 | | | | | | | | | | |
| 13 | 5.40 | 6.10 | 6.80 | 7.70 | 8.60 | 9.60 | | | | | | | | |
| 34 | | 6.60 | 7.30 | 8.40 | 9.50 | 10.90 | 1 | | | | | | | |
| 1 - | | 7.50 | 8.80 | 10.00 | 11.10 | 12.30 | 14.00 | | | | | | | |
| 114 | | 9.60 | 11.00 | 12.60 | 14.00 | 15.40 | 17.40 | | | | | | | |
| $1\frac{1}{2}$ | | | 12.00 | 13.60 | 15.00 | 16.60 | 19.40 | 22.60 | | | | | | |
| 2 | | | 12.40 | 14.00 | 15.40 | 17.00 | 21.40 | 23.0 | | | | | | |

CAST IRON CLIPS For Sprinkler Pipes

| Sizeinches | $\frac{1}{2}$ | 3/4 | 1 | 11/4 | $1\frac{1}{2}$ | 2 | 212 | 3 | 31/2 | 4 |
|------------|---------------|-----|-----|------|----------------|-----|-----|-----|------|------|
| Shorteach | .14 | .15 | .16 | .18 | .20 | .25 | .30 | .40 | .50 | .65 |
| Long " | .16 | .17 | .18 | .20 | .22 | .27 | .35 | .45 | .60 | . 75 |

PIPE HANGERS

SOLID RING



Fig. 4861A

SPLIT RING CONCRALED SCREW



Fig. 4861

SOLID RING

| Sizeinches | | | | | | | | | | | |
|----------------------|------|------|------|------|-------|-------|-------|--|--|--|--|
| Price, Plain per 100 | 5.00 | 5.00 | 5.80 | 7.75 | 10.00 | 14.00 | 22.00 | | | | |
| " Galvanized " | 6.50 | 6.50 | 7.00 | 9.00 | 12.00 | 16.00 | 20.00 | | | | |

SPLIT RING, CONCEALED SCREW

| Sizeinches | 3/8 | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|
| Price, Galvanizedper 100 | 17.00 | 17.00 | 20.00 | 25.00 | 30.00 | 40.00 | 50.00 |

SWIVEL BASE

SPLIT RING

EXTENSION



Fig. 4861D



Fig. 4861C

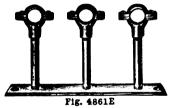
SWIVEL BASE

| Sizeinches | | | | | | | |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|
| Price, Galvanized per 100 | 17.00 | 17.00 | 20.00 | 25.00 | 30.00 | 40.00 | 50.00 |

EXTENSION

| Sizeinches | 3/8 | 1/2 | 3, | 1 | 11, | 112 | 2 | 212 | 3 | 4 |
|------------------------------------|-----|-----|-----|-----|------------|-----|------------|-----|-----|---------------------|
| Price, Plain each " Galvanized . " | .22 | .22 | .27 | .32 | .35 .40 | .40 | .50 | .70 | .90 | $\frac{1.10}{1.25}$ |
| Price, Plain w'ho't Nip. " | .17 | .17 | .22 | .33 | .30 | .35 | .60 .45 | .65 | .80 | 1.00 |
| " Galv. " " " | .20 | .20 | .25 | .30 | .35 | .45 | .55 | .70 | .90 | 1.15 |

Furnished with any size nipples from close to 4 inches long.



Prices on Application



Fig. 4861]

Hangers mounted from sketch. State distance from back of plate to center of hanger, also from center to center of pipes.

MALLEABLE IRON PIPE HANGERS

F. AND M. HANGERS





No. 206



P10 4858 A

TI- 4050

Fig. 4858C

| | Fig | . #8081 | 5 | | | rig. 480 | 180 | |
|------|--|---|--|--|---|--|---|--|
| 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 2½ | 3 |
| .10 | .10 | .12 | .12 | .14 | .16 | .18 | .22 | .28 |
| . 15 | .15 | .18 | .18 | .20 | .22 | .25 | .30 | .35 |
| .55 | .55 | .58 | .58 | .60 | .62 | .65 | .70 | .95 |
| 1/8 | 1/8 | 1/8 | 1/8 | 1/4 | _1/4 | 1/4 | 14 | 1/4 |
| 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 | 10 | |
| .43 | .53 | .58 | .63 | $^{-}.82$ | 1.12 | 1.32 | 1.72 | |
| .50 | .60 | .65 | .70 | .90 | 1.20 | 1.40 | 1.80 | |
| 1.10 | 1.20 | 1.25 | 1.35 | 1.50 | 1.80 | 2.00 | 2.40 | |
| 3/8 | 3 8 | 3 8 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | ١ |
| | .10 .15 .55 ½ 3½ .43 .50 1.10 | 3/8 1/2 .10 .10 .15 .15 .55 .55 1/8 1/8 .31/2 4 .43 .53 .50 .60 1.10 1.20 | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

Clamps to carry Pipe, $\frac{3}{8}$ to $\frac{31}{2}$ inches, each .40. $\frac{31}{2}$ to 10 inches, each .60. No. 200 No. 201 No. 204



Fig. 4858D



Fig. 4858E



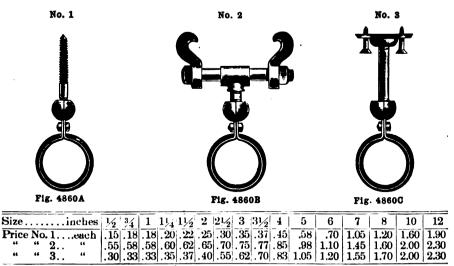
Fig. 4858F

| Size. | | | inches | 3/4 | 1 | 114 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 |
|--------|----|-------|--------|-----|-----|-----|------|------|----------------|-----|------|-----|------|------|------|------|------|
| Price, | No | . 200 | each | .12 | .13 | .14 | . 16 | . 20 | .25 | .32 | .42 | .52 | .57 | .62 | .90 | 1.40 | 1.70 |
| 66 | " | 201 | " | .17 | .18 | .20 | .22 | .28 | .33 | .40 | .50 | .60 | .65 | .70 | 1.00 | 1.50 | 1.80 |
| 46 | " | 204 | " | .32 | .33 | .34 | .36 | . 40 | .55 | .62 | . 72 | .82 | | 1.00 | 1.30 | | |

Price of No. 204 does not include rods.

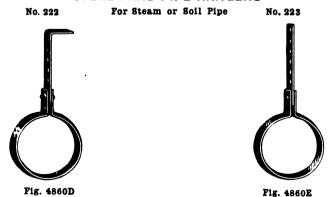
MALLEABLE AND STEEL PIPE HANGERS

HANNA BALL JOINT HANGERS



State size of iron beam when ordering No. 2 Hangers.

STEEL BAND PIPE HANGERS

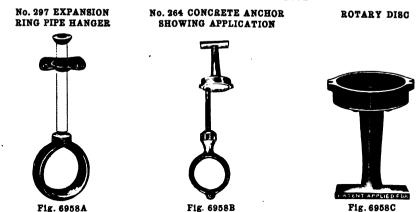


| Sizeinches | 34 | 1 | 114 | 11/2 | 2 | 21/2 | 3 |
|--------------------------------|------------|-----|------|------|-----|------------|-------------|
| Price, Plain each Galvanized " | .16 .24 | .18 | .30 | .22 | .24 | .26 .40 | .28 |
| Sizeinches | 31/2 | 4 | 41/2 | 5 | 6 | 7 | 8 |
| Price, Plain each Galvanized | .32 .48 | .34 | .36 | .38 | .63 | .65 .95 | .90 1.35 |

The bar furnished with these Hangers is shipped in 5-foot lengths and can be cut to length as required. Prices are based on 6 inches to each hanger.

PIPE HANGERS AND CLAMPS

HANGERS AND ANCHORS



EXPANSION RING PIPE HANGERS

| Sizeinches | $\frac{3}{4} + 1 \cdot \frac{1}{4} \frac{1}{12} \cdot 2 \cdot 2 \cdot 2 \cdot 3 \cdot 3 \cdot 2 \cdot 4$ | 41/2 5 6 7 8 |
|------------------|--|----------------------------------|
| Priceeach | .17 .18 .19 .25 .29 .36 .44 .55 .63 | |
| " Galvanized " | .25 .25 .28 .35 .45 .55 .65 .80 .95 | |
| " Plates only " | .08 .08 .08 .09 .09 .10 .10 .10 .10 | |
| " Buttons only " | .06 .06 .06 .07 .07 .08 .08 .08 .08 | |
| " Rings only " | .08[.12].15[.20].25[.30].40[.50].60[| |
| " " Galvanized " | .18 .18 .20 .30 .37 .45 .55 .70 .85 | 1.20 1.50 1.80 2.50 3.00 |

CONCRETE ANCHORS

| Tapped | inches | 7/16 | 58 |
|--------|--------|------|-----|
| Price | each | .30 | .40 |

MALLEABLE IRON ADJUSTABLE BEAM CLAMPS



| Number | 244 | 245 | 248 |
|-----------------------|---------------|-------------------|-----------|
| For Pipeinches | 3 ¿ to 3 | 3½ to 7 3 to 7 | 31/2 to 7 |
| Will Fit Beam Flanges | 3 to 7 .40 | .60 | .40 |
| | | | |

These clamps are built in proportion for the weight they have to carry.



FLOOR AND CEILING PLATES

CAST IRON FLOOR AND CEILING PLATES
FLOOR PLATE WITH GROOVE CEILING PLATE







Fig. 4827A

Fig. 4827B

| Sizeinches | 1/2 | 34 | 1 | 11/4 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 8 |
|--|-----|-----|-----|------|------|-----|--------------|-----|------------|-----|--------------|-------------|------|
| Price, Floor Plates, each Ceiling " | .06 | .06 | .08 | .11 | .14 | .16 | . 24 . 36 | .30 | .35 .55 | .42 | . 60 . 95 | .75 1.25 | 1.75 |

FLOOR PLATE

SPUN BRASS

CEILING PLATE



Fig. 4827C

Fig. 4827D

| Sizeinches | | | | | |
|--------------------------|-----|-----|-----|-----------|----|
| Price, Nickel Platedeach | .09 | .10 | .11 | .12 .13 . | 15 |

B AND C FLOOR AND CEILING PLATES

No. 6 FLOOR PLATE No. 7
FLOOR OR CEILING PLATE
WITH SPRINGS

No. 3 CEILING PLATE







Fig. 4827E

Fig. 4827F

Fig. 4827G

| Size inches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 | 21/2 |
|------------------------------------|------------|------|---------------------|------|--------------------------------------|---------------------|---------------------|---------------------|------|
| Price, Plain each Nickel Plated | .14 .25 | .14 | .14 .25 | .14 | .18 | .20 | .24 | .28 | |
| Size inches | | | | 41/2 | | | | | |
| Price, Plain each Nickel Plated " | .60 75 | 1.10 | $\frac{1.25}{1.50}$ | 1.40 | $\overline{\substack{1.60 \\ 2.00}}$ | $\frac{2.00}{2.50}$ | $\frac{2.25}{2.75}$ | $\frac{2.50}{3.00}$ | |

RUSSEL'S FLOOR AND CEILING PLATES







Fig. 4827J

| Sizeinches | 3/8 | 1/2 | 3/4 | 1 | 114 | 11/2 | 2 | 21/2 | 3 |
|----------------------------|-----|-----|-----|-----|-----|------|-----|------|------|
| Price, Nickel Plated, each | .25 | .25 | .25 | .28 | .32 | .35 | .38 | .52 | . 75 |

SEAMLESS BRASS TUBING



Fig. 4832A

IRON PIPE SIZES

Extras over Base Prices

| Iron Pipe Size inches | 1.6 | 14 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|----------------------------|---------|-------|------|------|------|-------|-------|-------|-------|
| Priceper pound | .08 | .07 | .02 | .01 | | BA | SE PR | CE | |
| Approx. Wt. per Footpounds | .25 | .43 | .62 | .9_ | 1.25 | 1.7 | 2.5 | 3 | 4 |
| Iron Pipe Sizeinches | 2^{1} | 3 | 31/2 | 4 | 416 | 5 | 6 | 7 | 8 |
| Priceper pound | BASE | PRICE | .01 | .02 | .04 | .06 | .07 | .09 | .11 |
| Approx. Wt. per Footpounds | 5.75 | 8.3 | 10.9 | 12.7 | 13.9 | 15.75 | 18.31 | 26.28 | 29.88 |

Stock lengths, 12 feet.

Copper, Bronze or Gilding Tube..... cents per pound advance.

CUTTING BRASS TUBING

Additional to Lists

| | Over 12 | Over 9 | Over 6 | Over 4 | Over 2 | Over 1 | Over |
|----------------|------------|-------------|------------|-----------------|-----------|------------------|------------|
| Lengthinches | 24 | up to 12 | up to 9 | up to | up to | up to | up to 1 |
| | inclusive | inclusive | inclusive | inclusive | inclusive | inclusive | inclusive |
| Priceper pound | .01 | .011/2 | .02 | $.021\acute{2}$ | .03 | $.03\frac{1}{2}$ | .04 |

No additional charge for cutting tubes to lengths over 24 inches.

For all seamless tubes of any shape other than round add to above price

HIGH BRASS RODS

Not Less than 2-foot Lengths. Brown & Sharpe's Gauge the Standard. Extras Over Base Prices

| Diameter | No.11 to 1 ginch inclusive | 1 ₈ to 1 ₄ inch inclusive | 1/4 to 1/2 inch inclusive | ½ to 1 inch inclusive | 1 to 3 inch inclusive |
|--|-------------------------------|---|--|-----------------------|--------------------------|
| Round Hexagon, Octagon and Square Rectangular and Half Round | .0813 | $02^{1}\frac{2}{2}$ $04^{1}\frac{2}{2}$ $06^{1}\frac{2}{2}$ | $001\frac{2}{2}$ $021\frac{2}{2}$ $041\frac{2}{2}$ | Base .02 .04 | .03 .05 .07 |

Larger than 3 inch prices on application.

Prices for rectangular and half round are governed by the inner dimension.

Shapes other than listed above, prices on application.

Prices are for 100 pounds or more of one item in one order.

Additional for Cutting High Brass Rods Less than 2 Feet

| Lengthinches | *2iandover | 12 to 24 | 9 to 12 | 6 to 9 | 4 to 6 | 2 to 4 | 1 to 2 |
|--------------------|------------|----------|---------|--------|--------|--------|--------|
| | | | | | | | |
| Priceper pound | 01 | .02 | .03 | .04 | .05 | .08 | .12 |
| Tileci,,,per pound | 1 .01 | ∪ 🛥 | 1 | .01 | | | |

^{*}Except stock lengths of 8, 10 and 12 feet, not less than .12 list advance.

Shorter than 1-inch, Special



BRASS AND BRAZED TUBING

SEAMLESS BRASS TUBING

CONDENSER TUBES-Extras Over Base Prices

| | | | Br | A88 | | ADMIRALTY | | | | | | | |
|-----------------|--------------------|-----|-------|-------|-----|-----------|--------------|-----|-----|--|--|--|--|
| Stubs' Gauge | B. and S. Gauge | | Size, | nches | • | | Size, Inches | | | | | | |
| Gauge | Gauge | 5/8 | 3/4 | 7/8 | 1 | 5/8 | 34 | 7/8 | 1 | | | | |
| 17 | | 04 | .04 | .04 | .04 | .07 | .07 | .07 | .07 | | | | |
| 18 | 16 | .04 | .04 | .04 | .04 | .07 | .07 | .07 | .07 | | | | |
| 19 | 17 | .06 | .06 | .06 | .06 | .09 | .09 | .09 | 09. | | | | |
| 20 | 18-19 | .08 | .06 | .06 | .06 | .11 | .09 | .09 | .09 | | | | |

| For tinning inside and outside, extra per pound | |
|--|-----|
| All seamless tubes, any shape other than round, add to price of Round Tubes of | .01 |
| corresponding size, per pound | .05 |
| For tinning tubes inside and outside other than Brass Condenser Tubes of size | ~ |
| _ specified above, add, per pound | |
| For tinning any size or kind of tube on one side only, add, per pound | .05 |
| For tinning tubes in lengths not over three inches on ends only, add not less than | |
| one cent per and | |

BRAZED TUBING

| Outside Diameter | | | | | | & S. | Gau | ge ti | he St | anda | ard | E | xtra | SOV | er B | ase l | rice | |
|------------------|-----------------------|----------|---------|-----|------|------|-----|-------|-------|------|------|------|------|-----|-----------|----------------|------|-----|
| B. & S. Gauge | Decimal Equivalent | 1/8 | 3∕6 | 14 | 3/16 | 3/8 | 1/2 | 5/8 | 3⁄4 | 1 | 11/4 | 1½ | 1¾ | 2 | 21/4 | $2\frac{1}{2}$ | 23/4 | 3 |
| 12 | .0808 | | | | | | | .01 | | | | | | .01 | .02 | .04 | .05 | .06 |
| 13 | .0719 | | | | | | | .01 | | | | | | .01 | .02 | .04 | .05 | .06 |
| 14 | .0640 | | | | | .04 | .02 | .01 | l | | | | | .01 | .02 | .04 | .05 | .06 |
| 15 | .0570 | | | | .10 | .04 | .02 | .01 | Į | DAG | E PF | | | .01 | .02 | .04 | .05 | .06 |
| 16 | .0508 | | | .25 | .10 | .04 | .02 | .01 | ı | DAJ | EFF | IICE | ' | .01 | .02 | .04 | .05 | .07 |
| 17 | .0452 | | | .25 | .10 | .04 | .02 | .01 | | | | | | .01 | .02 | .04 | .06 | .08 |
| 18 | .0403 | | .55 | | | .04 | .02 | .01 | | | | | | .01 | .02 | .05 | .07 | .09 |
| 19 | .0358 | | .55 | .25 | .10 | .04 | .02 | .01 | | | | | | .01 | .02 | .06 | .08 | .10 |
| 20 | .0319 | 1.07 | .57 | .27 | .12 | .06 | .04 | .02 | .01 | .01 | .01 | .01 | .01 | 02 | .04 | | | |
| 21 | .0284 | 1.09 | .59 | .29 | .14 | .08 | .05 | .03 | .03 | .03 | .03 | .03 | .03 | .05 | | | | |
| 22 | .0253 | 1.11 | .61 | .31 | .16 | .10 | .07 | 05. | .05 | .05 | .05 | .05 | .06 | .08 | . | | | |
| 23 | .0225 | 1.13 | .63 | .33 | .18 | .12 | .09 | .07 | .07 | .07 | .07 | .07 | .08 | l | | | | |
| 24 | .0201 | 1.17 | .67 | .37 | .22 | 1.16 | .13 | .11 | .10 | .10 | .10 | .10 | .10 | | | | | |

Square and hexagon tubing advance over corresponding size and gauge of Round Tubing, per pound, .06

Rectangular Tubing, advance over corresponding size and gauge of Round Tubing,

of narrower dimensions, per pound, .06
Fancy Pattern Tubing, advance over corresponding size and gauge of Round Tubing, per pound, .08

Extra Fancy Pattern Tubing, advance over corresponding size and gauge of Round Tubing, per pound, .16 Combination Tubing, advance per pound, .25

All Tubing between gauges takes price of nearest gauge.

For diameter of fractional parts of an inch, where no price is given, take the column to the left of where such size would appear if designated.

CUTTING BRAZED TUBING-Additional to List

| Lengthinches | Over 96 | Over 12 up to 96 | Over 6 up to 12 | Over 4 up to 6 | Over 2 up to 4 | Over 1 up to 2 |
|----------------|---------|------------------|-----------------|----------------|----------------|----------------|
| Priceper pound | .01 | No Charge | .02 | .03 | .04 | .06 |

Prices are for 100 pounds or more of one item of brazed tubing from mill. One inch and shorter, special prices on application.



LEAD PIPE AND SHEET LEAD

LEAD PIPE

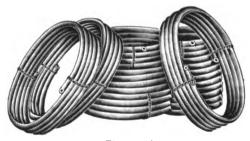


Fig. 6853A

| ght | ot | = | 1 | | | | Lig | | - N | ledi | 1m | ! | Stro | ug | <u> </u> | Exti | ıg | tra | Str | Ex- |
|---|----------|---|-------------------|------------------------|--|--------------------------------|----------------|---|------------------------------------|---------------|--|--|-------------|--|--------------------------------------|----------|---|----------------------------------|------------------|--------------------------------|
| ber | per Foot | Length of Coll | Weight | per Foot | Length of Coll | Weight | per Foot | Length of Coll | Weight | per Foot | Average Length of Coil Feet | Weight | per Foot | Length of Coll | Welght | per Foot | Length of Coil | Weight | per Foot | Average Length of Coll Feet |
| 1 1 1 2 2 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 2 3 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 8 10 12 | 175 140 100 85 55 55 50 34 11 12 | spunod11222334456 | Souno 9 12 4 8 | 197 1984 155 235 140 115 85 70 42 40 40 112 12 | spunod 1 1 2 2 2 3 4 4 5 6 6 8 | see 12 8 8 8 3 | 235 175 100 85 40 70 55 40 35 12 12 | punod 1 1 1 2 2 3 3 3 5 5 7 8 9 10 | 30uno 4 4 4 8 | 175 140 85 75 58 32 28 22 12 12 | spunod 1 1 2 3 3 4 4 6 6 8 11 12 15 16 | 8 12 8 12 8 | 120 115 80 67 48 50 35 36 23 18 12 12 12 | spunod 2 2 3 3 4 6 7 8 9 14 16 18 21 | 8 12 8 | 197 98 20 90 Value of Leaf 12 12 12 12 12 12 12 12 12 12 12 12 12 | spunod 2 3 3 4 5 6 9 10 17 20 25 | 8 12 8 | 30 24 15 12 15 12 12 |

SHEET LEAD

| Wire Gauge | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
|--|-----------------|-----------|----------------------|-----------|--------------|-----------|-----------|
| Thickness inches Weight, Sq. Foot pounds | 3 14 21/2 | 1/20 3 | 1/18 31/2 | 1/16 4 | 1/18 41/2 | 1/12 5 | 1/10 6 |
| Wire Gauge | 12 | 11 | 10 | 9 | 8 | 7 | •••• |
| Thickness inches Weight, Sq. Foot pounds | 1/i) 7 | 1/8 8 | ² 11 9 | 1/8 10 | 346 11 | 1/5 12 | |

Other weights rolled to order. Rolls are about 20 feet in length and from 7 to 8 feet 9 inche; wide.

FINISHED BRASS FITTINGS

IRON PIPE SIZE





Fig. 732A

TEE



Fig. 732B

CROSS



Fig. 7320

STANDARD



Fig. 732D

OCTAGON



Fig. 732E

| Sizeind | hes | 18 | 1/4 | 38 | 1/2 | 34 | 1 | 11/4 | 1½ | .2 | 2½ | 3 | 31/2 | 4 |
|-------------------|-----|-----|-----|---------|------|------|------|------|------|------------|--------------|---------------|-------|-------|
| Elbowse | ach | .24 | .34 | .42 | .56 | .70 | 1.00 | 1.70 | 2.20 | 3.00 | 7.00 | 9.00 | 14.00 | 20.00 |
| " Reducing. | " | | .44 | .52 | .70 | .90 | 1.25 | 2.20 | 2.80 | 3.80 | 8.80 | 11.30 | 17.50 | 25.00 |
| " 45· | " | .35 | .42 | .50 | .68 | .85 | 1.25 | 2.10 | 2.75 | 3.75 | 8.75 | 11.00 | | |
| " Street | 16 | .40 | .50 | .56 | .83 | 1.10 | 1.50 | 2.65 | 3.60 | 4.75 | l | | | |
| " Drop Female | " | l | .40 | .60 | .80 | 1.20 | 1.70 | 2.40 | 3.80 | 5.00 | | . | 1 | |
| " Side Outlet. | 46 | | | .60 | .80 | 1.20 | 1.70 | 2.40 | 3.20 | | <i>.</i> | | | |
| Tees | " | .30 | .40 | .60 | .80 | 1.00 | 1.50 | 2.00 | 2.60 | 3.50 | 8.00 | 11.00 | 18.00 | 26.00 |
| " Reducing | " | | .50 | .76 | 1.00 | 1.25 | 1.90 | 2.50 | 3.30 | 4.40 | 10.00 | 13.80 | 22.50 | 32.50 |
| " Drop Female | 66 | | | .70 | .90 | 1.40 | 2.10 | | | . | | . | l | |
| " Four Way | " | | | l | 1.00 | 1.40 | 2.00 | 2.70 | 3.60 | | l . <i>.</i> | l | | |
| Crosses | 66 | .40 | .60 | .80 | 1.00 | 1.20 | 1.60 | 3.00 | 4.00 | 7.00 | 10,00 | 14.00 | 20.00 | 29.00 |
| " Reducing. | " | i | .75 | 1.00 | 1.30 | 1.50 | 2.00 | 3.80 | 5.00 | 8.80 | 12.50 | 17.50 | 25.00 | 36.00 |
| Bushings | 66 | | .20 | .24 | .28 | .42 | .76 | 1.00 | 1.35 | 2.00 | 3.00 | 5.00 | 7.00 | 9.00 |
| Plugs | " | .18 | .20 | .24 | .30 | .40 | .56 | .80 | 1.00 | 1.80 | 2.50 | 4.00 | 6.00 | 8.00 |
| " Solid | " | | | | .60 | .80 | 1.10 | 1.60 | 2.00 | 3.60 | 7.00 | 12.00 | | |
| " Countersunk. | 44 | | | | .60 | .80 | 1.10 | ' | | . . | . . | . | | •••• |
| Caps | 64 | .30 | .30 | .40 | .50 | .70 | .90 | 1.20 | 1.60 | 2.20 | 4.00 | 6.00 | 10.00 | 12.00 |
| Locknuts | " | .20 | .20 | .24 | .30 | .40 | .60 | .90 | 1.40 | 1.90 | 3.00 | 5.50 | | |
| Reducers | " | | .32 | .44 | .64 | .90 | 1.30 | 1.80 | 2.25 | 3.70 | 6.00 | 9.00 | | |
| Couplings | " | .20 | .28 | .32 | .50 | .75 | 1.00 | 1.20 | 1.80 | 2.70 | 4.80 | | | 14.00 |
| " R.&L. | 66 | | .31 | .36 | .55 | .82 | 1.10 | 1.35 | 2.00 | 3.10 | . | . | | |
| Ret'n Bends Close | " | | | | 1.12 | 1.40 | 2.00 | 3.40 | 4.40 | 6.00 | . | . | | ١ |
| " " Open | " | | | | 1.40 | 1.75 | 2.50 | 4.30 | 5,50 | 7.50 | . | . | | |
| Y Bends | " | | | | | 2.00 | 2.50 | 5.10 | 5.80 | 9.00 | 13.00 | l . . | | |
| Unions,Standard. | " | | .36 | .50 | .70 | .90 | 1.25 | 1.70 | 2.50 | 3.60 | 6.00 | 7.75 | 15.00 | 22.50 |
| " Octagon | 66 | 50 | .55 | .75 | 1.00 | 1.50 | 2.00 | 2.50 | 3.00 | 4.50 | | | | |
| Nipples Short | " | .21 | .27 | .38 | .45 | .57 | .75 | 1.15 | 1.65 | 2.20 | 4.15 | | | |
| " Long | 44 | .23 | .30 | .45 | .53 | .68 | .90 | 1.35 | 1.90 | 2.50 | 4.50 | 6.75 | | |

The above fittings will be made to order, nickel plated, at an advance of 20 per cent.

ROUGH BRASS FITTINGS

IRON PIPE SIZE

ELBOW



Fig. 733A

TEE



Fig. 733B UNIONS HEXAGON

CROSS

Fig. 733C





Fig. 733D



Fig. 733E



Fig. 733F

| Sizeinche | 8 1/8 | 1/4 | 3/8 | 1/2 | 3/4 | 1 | $1\frac{1}{4}$ | $1\frac{1}{2}$ | 2 | 21/2 | 3 | 31/2 | 4 |
|-----------------------|--------|-----|-----|------|------|------|----------------|----------------|-------|------|-----------|-------|-------|
| Elbowseac | h .12 | .17 | .21 | .28 | .35 | .50 | .85 | 1.10 | 1.50 | 3.50 | 4.50 | 7.00 | 10.00 |
| " Reducing " | | .22 | .26 | .35 | .45 | .62 | 1.10 | 1.40 | 1.90 | 4.40 | 5.65 | 8.75 | 12.50 |
| " 45° " | .18 | .25 | .30 | .40 | .50 | .75 | 1.25 | 1.65 | 2.25 | 5.25 | 6.75 | | |
| " Street " | .25 | .30 | | .55 | .75 | 1.00 | 1.80 | 2.50 | 3.25 | | 11/1/2012 | | |
| " Drop Female " | | .20 | .30 | .40 | .60 | .85 | 1.20 | 1.90 | 2.50 | | | | |
| " Side Outlet " | | | .30 | .40 | .60 | .85 | 1.20 | 1.60 | | | | | |
| Tees " | | | | .40 | .50 | .75 | 1.00 | 1.30 | 1.75 | | | 9.00 | 13.00 |
| " Reducing " | | .25 | | .50 | .63 | .95 | 1.25 | 1.65 | 2.20 | | | 11.25 | |
| " Drop Female " | | | .35 | .45 | .70 | 1.05 | | | - | | | | |
| " 4-Way " | | | | .50 | .70 | 1.00 | 1.35 | | | 4 | | | |
| Crosses " | | | | .50 | .60 | .80 | 1.50 | 2.00 | | 5.00 | | 10.00 | |
| " Reducing " | | .38 | .50 | .65 | .75 | 1.00 | 1.90 | | 4.40 | | | 12.50 | |
| Bushings" | | .10 | | .14 | .21 | .38 | .50 | .67 | 1.00 | 1.50 | 2.50 | | |
| Plugs" | | .10 | | .15 | 20 | .28 | .40 | .50 | .90 | 1.25 | 2.00 | | |
| " Solid " | 1 32 3 | | 17 | .30 | .40 | .55 | .80 | 1.00 | 1.80 | | | | |
| " Countersunk " | | | ::: | .30 | .40 | .55 | .00 | .1.00 | 1.00 | | | N | |
| | .15 | .15 | | .25 | .35 | .45 | .60 | .80 | 1.10 | 2.00 | 3.00 | 5.00 | |
| Caps | | .10 | | .15 | .20 | .30 | .45 | .70 | .95 | 1.50 | | | |
| Reducers" | | .16 | .22 | .32 | .45 | .65 | .90 | 1.12 | 1.85 | 3.00 | 4.50 | | |
| Couplings" | .10 | .14 | .16 | .25 | .37 | .50 | .60 | .90 | 1.35 | 2.40 | 3.50 | 5.25 | 7.00 |
| " Right and Left " | | .17 | .20 | .30 | .45 | .60 | .75 | 1.12 | | | | 0.20 | |
| Return Bends, Close " | | | | .56 | .70 | 1.00 | 1.70 | 2.20 | | | | | |
| " " Open " | | | | .70 | .88 | 1.25 | 2.15 | 2.75 | 3.75 | | | | |
| Y Bends" | | | | | 1.00 | 1.25 | 2.55 | 2.90 | 4.50 | 650 | | •••• | |
| Uniona Standard " | | .36 | 50 | 70 | .90 | 1.25 | 1.70 | 2.50 | 3.60 | 0.00 | 7.75 | | |
| Unions, Standard " | | .50 | .50 | .70 | | 2.75 | 3.60 | | | 6.00 | 1.10 | | |
| nexagon | | 10 | | 1.90 | 2.35 | | | 4.25 | 0.100 | | | 10.50 | |
| Octagon | .00 | | | | 1.00 | 1.40 | 1.90 | 2.75 | 4.00 | | | 13.50 | 18.50 |
| Nippies Close | 1.12 | | .20 | .25 | .30 | .40 | .60 | .90 | 1.25 | 250 | 3.50 | | |
| Short | 1.14 | | | .30 | .38 | .50 | .75 | 1.10 | 1.45 | 2.75 | | | |
| " Long " | .15 | .20 | .30 | .35 | .45 | .60 | .90 | 1.25 | 1.60 | 3.00 | 4,50 | | |

BRASS FITTINGS

CAST IRON PATTERN, IRON PIPE SIZE

FOR WORKING PRESSURES UP TO 250 POUNDS









FLANGE UNION

Fig. 734A

Fig. 734B

Fig. 734C

| ŀ | • | U | U | G | r | |
|---|---|---|---|---|---|--|
| _ | _ | _ | _ | | _ | |
| _ | | _ | _ | | _ | |

| Sizeinche | 3/8 | 1/2 | 34 | 1 | 1,4 | 1½ | 2 | 21/2 | 3 | 3½ | 4 |
|--------------------------|-----|-----|------|------|------|------|------|------|-------|-------|-------|
| Price, Elbowseach | .28 | .36 | .70 | 1.00 | 1.50 | 2.00 | 3.00 | 5.50 | 8.50 | 12.50 | 16,00 |
| " 45°" | 1 | .43 | .84 | 1.20 | 1.80 | 2.40 | 3.60 | 6.60 | 10.20 | 15.50 | 20.00 |
| " " Reducing " | .32 | .42 | .80 | 1.15 | 1.72 | 2.30 | 3.45 | 6.30 | 9.75 | 14.50 | 18.50 |
| " Tees " | .40 | .65 | 1.00 | 1.35 | 2.00 | 3.00 | 4.50 | 7.50 | 11.00 | 16.50 | 20.00 |
| " " Reducing " | .46 | .75 | 1.15 | 1.55 | 2.30 | 3.45 | 5.20 | 8.60 | 12.65 | 18.00 | 22.00 |
| " Crosses " | 1 | .90 | 1.30 | 1.80 | 2.75 | 4.00 | 5.25 | 9.00 | 14.00 | 21.00 | 27.00 |
| " " Reducing " | 1 | | | | | | | | 16.00 | 24.00 | 30.00 |
| " Return Bends, Close. " | | .70 | | | | | | | | | |
| " " Open. " | | .75 | | | | | | | | | |
| " Couplings " | .35 | .50 | | | | | | 7.00 | | | |

FINISHED

| Size | inches | 3 8 | 1/2 | 34 | 1 | 1/4 | 11/2 | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 |
|--------|-----------------------|-----|------|------|------|------|------|-------|----------------|-------|-------|-------|
| Price, | Elbowseach | .56 | | | | | | | | | 25.00 | |
| 44 | " 45° " | l | .86 | 1.68 | 2.40 | 3.60 | 4.80 | 7.20 | 13.20 | 20.40 | 31.00 | 40.00 |
| 44 | " Reducing " | .64 | .84 | 1.60 | 2.30 | 3.44 | 4.60 | 6.90 | 12.60 | 19.50 | 29.00 | 37.00 |
| 44 | Tees " | .80 | 1.30 | 2.00 | 2.70 | 4.00 | 6.00 | 9.00 | 15.00 | 22.00 | 33.00 | 40.00 |
| 44 | " Reducing " | .92 | 1.50 | 2.30 | 3.10 | 4.60 | 6.90 | 10.40 | 17.20 | 25.30 | 36.00 | 44.00 |
| 44 | Crosses" | | 1.80 | 2.60 | 3.60 | 5.50 | 8.00 | 10.50 | 18.00 | 28.00 | 42.00 | 54.00 |
| 44 | " Reducing " | | 2.08 | 3.00 | 4.20 | 6.30 | 9.20 | 12.00 | 20.70 | 32.00 | 48.00 | 60.00 |
| 44 | Return Bends, Close " | | | | | | | | | | | |
| 44 | " " Open " | | | | | | | | | | | |
| " | Couplings " | | | | | | | | | | | |

FLANGE UNIONS, ROUGH

| Sizeinches | 1/2 | 34 | 1 | 1!4 | 11/2 | 2 | 21_{2} | 3 | 31,2 | 4 | 5 | 6 |
|---------------------------------------|------|------|------|-------|------|------|---------------|-------|-------|-------|-------|-------|
| Priceeach | 3.50 | 3.50 | 3.75 | 4.25 | 5.60 | 6.50 | 8.50 | 10.50 | 13.50 | 15.00 | 22.00 | 27.00 |
| Diam. of Flangesinches Boltsnumber | 276 | 234 | 3!4 | 313/6 | 41.8 | 47/8 | 5^{11}_{16} | 6916 | 71/6 | 758 | 811/6 | 978 |
| Boltsnumber | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 6 |

FLANGE UNIONS, EXTRA HEAVY

| Sizeinches | 3/4 | 1 | 1^{1}_{4} | 11/2 | 2 | 21.2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|---------------------------------------|------|------|-------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Priceeach | 5.00 | 6.50 | 8.00 | 9.50 | 12.00 | 14.50 | 18.00 | 21.00 | 24.00 | 28.00 | 35.00 | 45.00 |
| Diam. of Flangesinches Boltsnumber | 3!4 | 358 | 41/8 | 45 8 | 53% | 6 | 634 | 71/2 | 8 | 834 | 93 8 | 107 8 |
| Boltsnumber | 4 | 4 | 4 | 4 | 5. | 5 | 6 | 6 | 7 | 8 | 8 | 9 |

Brass Flange Unions are furnished with Iron Bolts unless otherwise ordered.



DETACHABLE LINK CHAIN



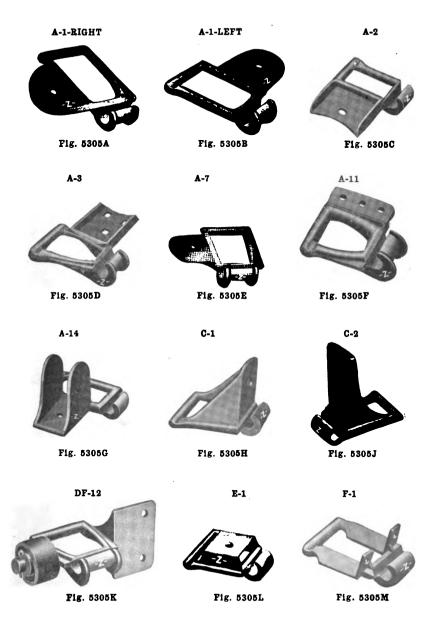
Fig. 2385A

| Nu | mber. | Plain Links, per Foot | Links, per 10 Feet | Couplers, per Pair | Number | Plain Links per Foot | Links, per 10 Feet | Couplers per Pair |
|---------|-------|--------------------------|-----------------------|-----------------------|------------------|-------------------------|-----------------------|----------------------|
| | 20 | .23 | 212 | | 621/2 | .23 | 73 | |
| | 22 | .21 | 240 | | 063 | .25 | 80 | .22 |
| | 23 | .16 | 185 | | 64 | .23 | 59 | |
| | 024 | .14 | 133 | | 65 | .18 | 57 | |
| | 025 | .14 | | | *66 | .23 | 60 | .22 |
| | | | 120 | **** | | | 52 | .22 |
| | *25 | .11 | 133 | .11 | *67 | .23 | | .22 |
| | 027 | .13 | 129 | .12 | 070 | .29 | 65 | |
| | 029 | .76 | 130 | | 71 | .32 | 73 | |
| | 032 | .23 | 133 | | 0711/2 | .32 | 58 | |
| | *32 | .11 | 104 | .14 | 711/2 | .29 | 60 | .31 |
| | 321/2 | .16 | 104 | | 072 | .35 | 73 | .31 |
| | *33 | .11 | 86 | .13 | 72 | .29 | 59 | |
| | *34 | .11 | 86 | .13 | 0721/2 | .34 | 72 | |
| | 341/2 | .14 | 104 | | 721% | .37 | 73 | .32 |
| | *35 | .11 | 74 | 16 | 73 | .32 | 38 | .02 |
| I L | | | | | 075 | .30 | 58 | |
| Light | 361/2 | .15 | 80 | | | | | **** |
| | 37 | .11 | 60 | | *75 | .24 | 46 | .19 |
| | 38 | .11 | 60 | | $75\frac{1}{2}$ | .23 | 46 | |
| | 042 | .16 | 88 | | 76 | .31 | 52 | |
| | *42 | .12 | 88 | .16 | 761/2 | .25 | 58 | .26 |
| Keeper | 42 | .13 | 88 | | *77 | .25 | 52 | .22 |
| | 44 | .12 | 81 | .16 | 771/2 | 36 | 52 | |
| | *45 | .11 | 74 | .16 | *78 | .34 | 46 | .25 |
| | 47 | .14 | 74 | .10 | *83 | .35 | 30 | .32 |
| | 48 | .13 | 60 | | *85 | .44 | 30 | .44 |
| | 50 | | 88 | | *88 | .43 | 46 | .28 |
| | | .16 | | | | | | |
| | 051 | .24 | 152 | | 881/2 | .59 | 46 | .44 |
| | *51 | .17 | 104 | .16 | . 89 | .52 | 46 | **** |
| Frictio | | .30 | 104 | | *93 | .49 | 30 | .44 |
| | 052 | .21 | 80 | | *95 | .53 | 30 | .54 |
| | *52 | .18 | 80 | .16 | 101 | .58 | 45 | .55 |
| Light | 521/2 | .16 | 80 | | *103 | .67 | 39 | .58 |
| Heavy | | .24 | 79 | | *1041/2 | .83 | 26 | .84 |
| Keeper | | .18 | 90 | | 105 | .49 | 20 | 66 |
| Weeher | 54 | .16 | 82 | | *108 | .63 | 251/2 | .79 |
| | 055 | .18 | 74 | | *110 | .74 | 251/2 | .92 |
| 17 | | | | | | | 37 | .84 |
| 1) | 3)55 | .22 | 73 | 10 | *114 | .85 | | .04 |
| | *55 | . 16 | 74 | .16 | 115 | .94 | 37 | |
| Кеерег | 55 | .17 | 74 | | $116\frac{1}{2}$ | 1.05 | 37 | **** |
| | 551/2 | .18 | 74 | | 117 | 1.01 | 37 | |
| | 056 | .24 | 80 | | 118 | 1.09 | 37 | |
| | 057 | .18 | 74 | | *122 | 1.13 | 20 | 1.58 |
| | *57 | .18 | 52 | .19 | 123 | 1.16 | 36 | |
| | 58 | .18 | 75 | | *124 | 1.03 | 30 | 1.19 |
| | 062 | .25 | 73 | | 130 | 1.56 | 34 | 1 |
| | | .23 | 73 | 99 | *146 | 1.02 | 20 | 1.29 |
| | *62 | . 22 | 10 | .22 | *140 | 1.04 | 20 | 1.20 |

*Standard sizes.

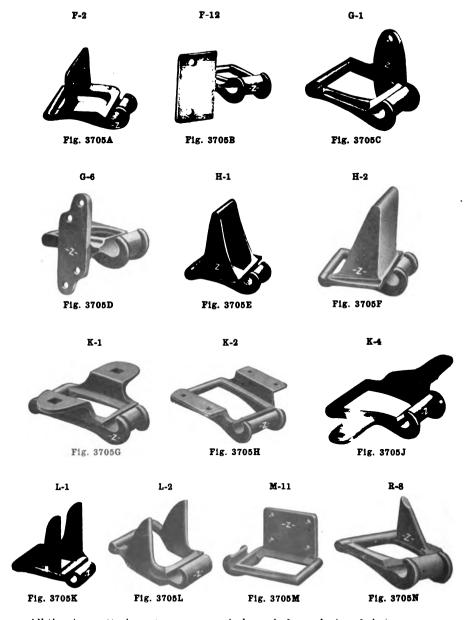
For attachment at intervals add 10 per cent. to proportional list.

ATTACHMENTS FOR LINK BELTING



All the above attachments are not regularly made for each size of chain.

ATTACHMENTS FOR LINK BELTING



All the above attachments are not regularly made for each size of chain.



ATTACHMENT LINKS PRICE PER FOOT

| | | PRICE | FR 1001 | |
|----------------|------------|------------------|----------------|------------------|
| No. 22 | | No. 25-Continued | No. 33 | No. 35—Continued |
| R4 | .40 | R35 | *A1 | *S1 |
| R39 | .32 | R44 | A1, No. Hole, | No. 37 |
| Wa 000 | | R16 | A6 | K5 |
| No. 023 D61 | .38 | R48 | A29 | L3 |
| E31 | .21 | R5625 | A10730 | L8 |
| | | R5925 | D3 | L11 |
| No. 024 | | R6223 | *D5 | L12 |
| C1 | .27 | R67 | D16 | L1432 |
| | | R70 | *E1 | No. 38 |
| No. 25 | | R78 | EM1 | C9 |
| A1 | .21 | *S1 | H2 | E1 |
| *A3 | .22 | 0 | 13 | E-Pin73 |
| A39 | .20 | No. 027 | *K1 | No. 42 |
| A46 | .15 | A1 | *K3 | *A1 |
| A51 | .20 | A5123 | *K5 | A3 |
| C3 | .58 | K1 | *K6 | A6 |
| *C1 | .29 | | K11 | A1434 A2925 |
| C4 | .19 .51 | No. 032 | K13 | A3625 |
| C5 C25 | .24 | A85 | *L2 | A8429 |
| *D3 | .26 | A8650 | L20 | *C1 |
| D15 | .16 | | *M1 | C18 |
| D28 | .17 | No. 32 | *S1 | D2 |
| D33 | .18 | *A1 | No. 34 | E1 |
| D46 | .21 | A2 | *A1 | G27 |
| *E1 | .21 .36 | *A3 | A52 | I13 |
| E16 | .28 | A13 | C2 | K1 |
| *G1 | .28 | A50 | C632 | *K3 |
| G30 | .33 | *C132 | C15 | K3½ |
| *H2 | .28 | C5 | C35 | *K5 |
| Н16 | .41 | *D3 | D44 | *K6 |
| *HO2 | .42 | D46 | *E1 | M2 |
| H23 | .25 | *E1 | 130 | 83 |
| I3 | .23 .34 | *ED | *K1 | |
| *K1 | .26 | *G1 | K31 37 | No. 44 |
| *K5 | .23 | I3 | K3749 | A3 |
| *K6 | .29 | I21 | K38 | K1 |
| L19 | .21 | *K1 | <u>U</u> | K59 |
| L20 | .23 | K3 | No. 35 | |
| *M1 | .27 .23 | K5 | *A1 | No. 45 |
| 01 02 | .23 .27 | *K6 | *A232 A1024 | *A1 |
| R4 | .26 | L1 | *A14½27 | *A3 |
| R10 | .30 | L18 | *C132 | A10 |
| R16 | .30 | L19 | D9 | *A14½ |
| K26 | .18 | L20 | *E1 | A12 |
| R27 | .22 | M1 | E18 | A13 |
| R28 | .28 | M43 | $G27 \dots 28$ | A20 |
| R29 | .22 .28 | S1 | I3169 *K132 | A26 |
| IWI | .40 | U | *K1 | A41 |

Attachments marked * are for standard sizes.

For attachments at intervals, add 10 per cent to proportional list.

ATTACHMENT LINKS

| No. 48 | | | PRICE PI | ER FOOT | |
|--|------------------------------|-----|--|---|------------------|
| A29. 22 | No. 45-Continu | ed | No. 47—Continued | No. 52-Continued | No. 55—Continued |
| A37 31 | | | | | |
| A49 | | | | | |
| A73. 29 A3 No. 20 D34 A11 K10 32 A74. 222 B11 57 *E1 33 K40 60 A83 38 B2 51 *F2 31 *L12 25 A109 21 C29 32 F13 58 *S1 25 A109 21 C29 32 P13 58 *S1 25 C1 27 C9 28 No. 50 | | | - | D13 | K5 |
| A74. 22 B1 57 *E1 33 K40 60 A93 38 B2 51 *F2 43 *M1 28 A110 31 K1 39 12 47 K17 40 40 K17 40 | | | No. 48 | D34 | |
| A93. 38 | | | A3 | *E1 | K4060 |
| A109 21 C29 32 FF2 43 *M1 28 A110 31 K1 39 12 47 K17 40 C9 28 No. 50 *G15 34 A1 24 *K1 35 K39 35 C15 34 A1 24 *K1 35 K39 35 C27 38 A61 32 *K5 32 K49 39 36 C27 38 A61 32 *K5 32 K49 39 30 C34 60 D49 .65 K44 32 K49 39 D59 .70 R19 .25 K66 32 C37 29 D59 .70 R19 .25 K66 .67 K62 .27 D18 .25 A86 .39 C1 .34 K11 .22 K69 .27 D18 .25 A86 .39 C1 .34 K11 .28 K62 .27 D18 .25 A86 .39 C1 .34 K11 .28 L10 .70 A86 .39 C1 .32 L21 .30 M17 .32 K29 L21 .30 M17 .32 K29 L21 .31 M5 .55 K29 .32 K62 .3 | | | | *E3 | *L2 |
| A110 31 K1 39 F13 58 481 25 C10 29 28 | | | B2 | *F243 | *M128 |
| *C1. 27 | | | $\begin{bmatrix} C^{29}, \dots, S^{2} \end{bmatrix}$ | F13 | *S1 |
| C9 28 No. 50 *(11 32 K28 35 C15 34 A1 24 *K1 35 K39 30 C22 42 AJ 43 K41 32 K45 70 C28 42 AJ 43 K41 32 K49 39 C34 60 D49 65 K46 32 K49 39 C37 29 D59 70 R19 25 K56 30 D6 32 No. 51 No. 51 No. 51 No. 51 No. 53 K60 67 P06 32 A1 No. 51 No. 51 No. 53 Keper K62 27 D18 25 No. 51 No. 53 Keper L2WEB 27 P1018 25 No. 51 No. 53 Keper L2WEB 27 E11 21 41 52 K3 51 M5 55 | | | K139 | 12 47 | K17 40 |
| C15. 34 | | | No so | *G1 32 | |
| **C27 | | | | | K39 30 |
| C28 A2 AJ A3 K41 32 K49 39 C34 .60 D49 .65 K46 .32 K52 .32 D1 .58 K3½ .67 R19 .25 K56 .32 D6 .32 No. 51 R19 .25 K60 .67 D18 .25 A96 .39 R1 .25 K60 .67 P043 .30 A96 .39 E1 .28 L2 .27 E11 .21 .21 .25 .43 .21 .21 .20 .20 E11 .21 .21 .41 .52 .43 .51 .30 M17 .32 .25 <td></td> <td></td> <td></td> <td></td> <td>K45 70</td> | | | | | K45 70 |
| C34 60 D49 .65 K46 .32 K52 .32 C37 29 D59 .70 R19 .25 K56 .30 *D5 32 No. 51 R30 .25 K60 .67 *D6 .32 No. 51 No. 53 K60 .67 *D43 .30 A96 .39 C1 .32 L2 .30 *P43 .30 A96 .39 C1 .32 L21 .30 *E1 .21 *C14 .52 K3 .51 M5 .25 .25 *E1 .21 *C14 .52 K3 .51 M5 .55 .55 M17 .32 L21 .30 M17 .32 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .25 .24 .24 .24 .25 | | | | | K49 30 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | | | D40 65 | | K52 39 |
| D1 | | | D50 70 | R19 | K56 30 |
| ***P5 | | | 1009 10 1791 / | | K60 67 |
| D6 | | | $K_0/2 \dots 0$ | 1.50 | K69 97 |
| D18 | | | Wo 81 | No. 53 Keeper | 1.9 WFB 97 |
| D18 | | | *A1 25 | | |
| D45 | | | A96 39 | | |
| The color of the | *D43 | | | | 105 05 |
| *E1 | | | | | ME |
| E4 18 D4 69 No. 55 R45 25 E12 14 D35 .77 1A 41 25 81 .25 F2 27 D38 .80 5A .24 .24 .25 .50 .30 *G1 .23 D55 .86 *A2 .24 .25 .55 .30 *G23 .26 D70 .36 *A2 .32 .41 .42 .41 .44 .41 .44 .41 .44 .41 .42 .42 .43 .43 .32 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .42 .441 .43 .441 .442< | | | | 1 === | M0 |
| E12 | *E2 | | D4 60 | | |
| F2 | | | D5 49 | No. 55 | |
| F2. 27 153 30 2A 24 E21 18 D38 80 5A 55 G23 26 D55 86 *A1 25 4*13 30 D70 36 *A2 32 115 28 15 42 A41 42 117 48 15 42 A41 42 A25 33 *K1 26 16 32 A41 42 A25 33 *K3 34 124 .56 A68 .35 A41 .43 *K3 34 124 .56 A99 .44 A41 .43 *K6 .36 132 .41 *AD5 .45 A25 .42 *K44 .26 134 .35 *C1 .31 A95 .54 *K44 .27 *K1 .32 *C8 .45 A25 A2 .42 | $\mathbf{E} 1 2 \dots \dots$ | .14 | | | |
| E21. | F2 | .27 | | | <u> 8530</u> |
| *G1 | $\mathbf{E21}$ | .18 | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *G1 | | | *A125 | No. 55 Keeper |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | G23 | .26 | | *A2 | A2 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *I3 | .30 | | A3 32 | A4144 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | I15 | .28 | | A20 26 | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | .48 | | | 1 405 |
| *K3 | *K1 | .26 | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *K3 | .34 | 124 | | A41 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *K5 | .25 | 125 | | No EGI |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | K6 | .36 | 132 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *K34 | | | | A29 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | A90 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *K44 | | | | No OE7 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | K45 | | | | |
| L3 .24 K28 .33 C37 .45 L3 .25 L13 .19 M1 .42 .81 .50 .53 L4 .37 *M1 .25 R24 .28 *D41 .66 .66 .66 .70 | *L2 | | K7 | C2000 | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | Ī.3 | | K28 | O37 45 | T.9 95 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | *1)5 52 | I.A 27 |
| N1 .17 *S1 .28 D42 .34 No. 57 N3 .22 No. 52 D43 .36 *A1 .30 P1 .43 *A1 .28 *E1 .25 A3 .33 *S1 .23 *A3 .34 EA3 .32 A7 .30 S6 .24 A14 .59 *F2 .35 A8 .27 S4 .26 A17 .28 G2 .20 A31 .44 A19½ .49 G26 .33 A60 .43 No. 47 C1 .33 G27 .35 C1 .30 C5 .36 C2 .43 G34 .37 C4 .21 | | | | | 114 |
| N3 | | | *S1 | 100 00 | ** |
| P1 .43 *A1 .28 *E1 .25 A3 .33 *S1 .23 *A3 .34 EA3 .32 A7 .30 S6 .24 A14 .59 *F2 .35 A8 .27 S4 .26 A17 .28 G2 .20 A31 .44 A19½ .49 G26 .33 A60 .43 No. 47 C1 .33 G27 .35 C1 .30 C5 .36 C2 .43 G34 .37 C4 .21 | | | | D49 | NO. 57 |
| *\$1 | | | No. 52 | 1240 | "A1 |
| S6. .24 A14 .59 *F2 .35 A8 .27 S4. .26 A17 .28 G2 .20 A31 .44 No. 47 C1 .33 G26 .33 A60 .43 C5. .36 C2 .43 G34 .37 C4 .21 | | | | 15.42 | A3 |
| S4 .26 A17 .28 G2 .20 A31 .44 No. 47 C1 .33 G26 .33 A60 .43 C5 .36 C2 .43 G34 .37 C4 .21 | | | | | |
| No. 47 C133 G2735 C130 C536 C243 G3437 C421 | | | | | A8 |
| No. 47 C1 | . D1 | .20 | A17 | $\begin{vmatrix} G2 & & .20 \\ GSa & & \end{vmatrix}$ | A3144 |
| C5 | N 45 | | | [G26 | A60 |
| C5 | | | | $\begin{bmatrix} G27 \dots & \end{bmatrix}$ | |
| C33 | C5 | | C2 | | |
| | <u>C33</u> | .41 | C42 | 126 | *D5 |

Attachments marked * are for standard sizes.

For attachments at intervals, add 10 per cent to proportional list.



ATTACHMENT LINKS

PRICE PER FOOT

| | | - | | - |
|---------------|--------------|-------------------|------------------|------------------|
| No. 57—Contin | | No. 66 | No. 75—Continued | No. 78—Continued |
| D25 | .25 | A11335 | M3 | G25 1.38 |
| * <u>E</u> 1 | .27 | C140 | *R1 | *H1 |
| E10 | .33 | E4 | R2 | H2 |
| *EA1 | .39 | I1 | R834 | *H6 1.01 |
| *EA2 | .33 | K1 | R50 | H22 1.03 |
| +100 | .43 | | 100 | *171 47 |
| *F2 | | K15 | No. 77 | *K1 |
| F9 | .76 | L16 | *A137 | K3 |
| *H2 | .44 | R18 | A1255 | K54 |
| H15 | .51 | F2 | *A02 40 | K5557 |
| *K1 | .35 | Н1 | *A23 | L6 |
| K22 | .41 | | A97 | *M370 |
| *M3 | .41 | No. 67 | A112 | M35 1.21 |
| Mis | .52 | *A132 | D5 | 340E TO . 11 |
| M15 | | A7 | *E1 | M35, Roller |
| <u>82</u> | .32 | | *F264 | *R142 |
| Tube, each. | .05 | | *G148 | R3 |
| | | A19½54 | G5 | R8 |
| No. 59 | 077 | A72 | | R2062 |
| A23 | .27 | A111 | *G651 | R37 |
| A87 | .25 | *D5 | G19 | R38 |
| | | D17 | G32 50 | S2 |
| No. 62 | 20 | D26 | *H1 | S2 |
| A1, Coupler. | .39 | *E137 | H251 | |
| *A1 | .32 | | Н356 | No. 83 |
| A2 | .33 | *F248 | *K1 | A1 |
| *A3 | .34 | *FF | *K354 | E1 |
| *A12 | .39 | *G150 | TO AE | E257 |
| A39 | .45 | G13 | K845 | E13 |
| A45 | .25 | *H1 | K21 | |
| A58 | .39 | H1953 | L20 | *D5 |
| A09 | .35 | *K140 | M10 | E17 |
| A92 | .39 | K2037 | M3386 | *FF |
| *C1 | | M1951 | R1 | F1566 |
| C5 | .58 | | *R336 | *G1 |
| <u>C8</u> | .35 | | S239 | G24 |
| *D5 | . 4 5 | Rope socket, ea21 | | *K163 |
| D53 | .69 | No. 73 | No. 78 | *M375 |
| D64 | .62 | S2 | *A359 | W2 1.55 |
| E4 | .27 | | A7 | |
| G1 | .46 | No. 074 | *A1150 | F15,Coupler |
| G27 | .39 | K1 1.18 | A1685 | |
| *I3 | .43 | | A23 | No. 83 Keeper |
| J1 | .53 | No. 74 | A3362 | G1 |
| #171 | .35 | K8 | *A6361 | |
| *K1 | | | *A00 | No. 85 |
| *K5 | .33 | No. 75 | A7056 | |
| K40 | .42 | A23 59 | A72 60 | D5 |
| L4 | .42 | A34 | A88 | E2 |
| M17 | . 34 | C4 | *D5 | F1 |
| S 1 | .32 | E1 | *D12 | *F2 |
| | | *F252 | *E1 | F592 |
| No. 6214 | | *G152 | *F2 | F81.06 |
| A3 | .34 | *H145 | F4 | FF81 |
| A3 no hole | .36 | H245 | F17 | G6 |
| | | H351 | *FF73 | H172 |
| No. 65 | 50 | 114 01 | *O1 =0 | |
| B1 | .53 | H4 | *G1 | |
| B2 | .57 | H2548 | G19 | K480 |
| C29 | .32 | *K1 | *G6 68_ | K7 |
| *** | | | • | |

Attachments marked * are for standard sizes. For attachments at intervals, add 10 per cent to proportional list.

ATTACHMENT LINKS

PRICE PER FOOT

| No. 85—Continued | No. 95 | No. 103—Continued | No. 114 |
|------------------|-----------|-------------------|-----------|
| M3 | A.22 | *L2 1.26 | A11 1.06 |
| S2 64 | *F2 1.10 | *M3 1.16 | C1 1.22 |
| | H1 | *M11 | C7 1.69 |
| No. 88 | *K2 | R182 | D5 1.46 |
| A1 | K29 2.06 | R390 | *DD 1.55 |
| *A3 | | 100 | *F8 1.33 |
| *A11 | No. 101 | | K1 1.21 |
| C1 | | No. 104 | K2 1.27 |
| D5 67 | A3 | K2 1.46 | *N1 1.28 |
| DH 1.30 | G6 | K33 1.44 | |
| E1 | K1 | | |
| *F280 | | | No. 122 |
| F690 | No. 103 | No. 105 | |
| *F889 | No. 103 | F1 | F2 1.58 |
| FF | *A191 | H292 | *K21.66 |
| *G1 | A3 1.02 | H4 1.55 | M32 4.40 |
| *G6 | *A4 | H24 1.52 | |
| G19 | *A11 | H26 1.60 | |
| G25 1.37 | *A11½1.11 | K2 | No. 124 |
| G29 | A24 | K4 | C13 2.03 |
| *H1 | D5 1.02 | M3 1.14 | *F2 1.54 |
| | *DD 1.40 | M.5 1.14 | F8 1.84 |
| | | | G1 1.47 |
| | | | *G6 1.58 |
| K5 | F7 1.30 | No. 108 | G19 1.44 |
| K26 1.30 | F8 1.26 | *F2 1.18 | *K1 1.56 |
| *M3 | *G6 1.13 | F3 1.04 | *ICMO |
| *R1 | G10 1.13 | FF 1.12 | *KM3 2.05 |
| *R2 | *G19 1.09 | G1 | M3 1.59 |
| R854 | G29 1.33 | *K2 1.02 | |
| R13 64 | G31 1.40 | K25 1.47 | |
| S2 62 | *H2 1.02 | K42 1.62 | No. 146 |
| • | Н6 1.76 | | E2 1.37 |
| ∤ No. 93 | H12 1.18 | | F2 1.49 |
| A64 1.40 | H14 1.35 | No. 110 | F5 1.46 |
| F15 | K19 1.57 | F2 1.27 | K2 1.76 |
| G1 90 | K63 1.54 | K2 1.12 | K4 1.46 |
| | | | |

Attachments marked * are for standard sizes. For attachments at intervals, add 10 per cent to proportional list.

DETACHABLE TRANSFER CHAINS



Fig. 2389A

Number 500

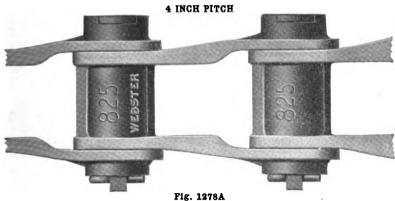
Working strain 1400 pounds Pitch, Inches

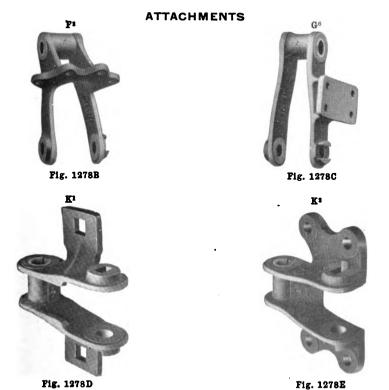
Price per foot .45



LEY BUSHED CHAIN AND ATTACHMENTS

No. 825 CHAIN





For description, dimensions, prices, etc., see following page.

LEY BUSHED CHAIN AND ATTACHMENTS

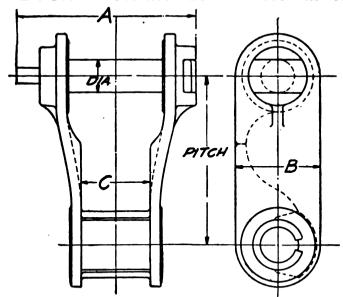


Fig. 3884A

This chain is especially adapted for heavy drives, and for elevators and conveyors handling ore, sand, coke, ashes and other gritty materials.

It is made with a case-hardened steel bush which alone comes in contact with the

sprocket wheel. The chain is detachable, and the bushing can be cheaply renewed. No portion of the malleable link is exposed to wear, and the life of the chain is almost unlimited.

DIMENSIONS

| - | | | | | D 1 141 | -1101011 | - |
|-----|--------|--------|-----------------|-------------------|-----------------|---------------------|---|
| No. | | | GENI | ERAL DI INCHES | MEN. | Average Ultimate | Attachments |
| | Inches | Inches | A | В | C | *Strength Pounds | |
| 823 | 4 | 1/2 | 35/8 | 13/8 | 11/2 | 18000 | A ⁴² , F ² , G ⁶ , K ² |
| 825 | 4 | 3/4 | 4 | 2 | 1 16 | 28300 | A ³⁸ , A ⁴² , F ² , G ⁶ , K ¹ , K ² |
| 835 | 4 | 5/8 | 57/8 | 2 | 21/2 | 25200 | K ² |
| 840 | 6 | 3/4 | $6\frac{1}{16}$ | 21/4 | 2 | 32000 | K ² |
| 841 | 6 | 3/4 | 61/8 | 21/8 | 21/8 | 44000 | K ² |
| 844 | 6 | 3/4 | 6 | 21/8 | $2\frac{7}{16}$ | 46000 | A 42, K2 |
| 847 | 6 | 1 | 711 | 3 | 215 | 54250 | K ² |

| | | | | PRI | CE L | IST | | | | | |
|----------------------------|-------|-----|-----|------|------|------|------|------|------|------|------|
| Num | ber | | | | 823 | 825 | 835 | 840 | 841 | 844 | 847 |
| Price, Plain Linksper foot | | | | | 1.00 | 1.65 | 1.70 | 1.65 | 1.65 | 1.65 | 2.60 |
| 66 | | | nts | 66 | | 1.85 | | | | | |
| 66 | A 42 | -66 | | 66 | 1.50 | 2.10 | | | | 2.00 | |
| 44 | A65 | 66 | | 66 | 1.25 | | | | | | |
| 44 | F^2 | 66 | | 66 | 1.60 | 2.05 | | | | | |
| 46 | G1 or | G6" | | 66 | 1.60 | 2.25 | | | | | |
| 66 | K^1 | " | | 46 | | 2.25 | | | | | |
| 46 | K^2 | 66 | | 66 | 1.30 | 2.40 | 2.10 | 2.00 | 2.00 | 2.00 | 3.65 |
| 66 | K4 | 66 | | 66 | | | | 2.50 | | | |
| 66 | | | | each | .11 | .20 | .14 | .20 | .20 | .20 | .32 |
| 44 | | | | | .08 | .10 | .10 | .10 | .10 | .10 | .15 |

RIVETED DRIVE CHAIN

No. 78. ONE-HALF ACTUAL SIZE



Fig. 104A

This chain is manufactured for the sawmill trade and for places where a strong and moderate priced chain is required. It is made to fit standard sprockets.

PRICE LIST AND DIMENSIONS In Effect Jan. 1, 1907

| No. | Pitch Inches | Diameter of Pin Inches | Average Ultimate Strength Pounds | Price, Plain per Foot | Matches and Works on Detach. Link Belting No. | Approximate Weight per 10 Feet, Includ- ing Rivets Pour ds |
|-----|-----------------|------------------------------|---|--------------------------|--|--|
| 60 | 23/8 | 5/16 | 7000 | .25 | 67 | 21.1 |
| 73 | 23/8 | | 13000 | .35 | 77 | 40.8 |
| 74 | 25/8 | /16 3/8 | 10000 | .27 | 75-78-88 | 27.9 |
| 75 | 25/8 | 5/6 | 7000 | .25 | 75-78-88 | 20.9 |
| 78 | 25/8 | 1/2 | 14000 | .37 | 75-78-88 | 41.8 |
| 82 | 3 | 9 16 | 18000 | .50 | 103 | 56.2 |
| 85 | 4 | 9 16 7 16 | 13000 | .33 | 85 | 33.2 |
| 87 | 4 | 5/8 | 20000 | .65 | 124 | 69.6 |
| 95 | 4 | 1/2 | 15000 | .45 | 95 | 50.8 |
| 108 | 43/4 | 9 16 | 18000 | .50 | 108 | 58.1 |
| 124 | 4 | 3/4 | 30000 | .75 | 124 | 84.4 |

REVISED PRICE LIST OF ATTACHMENTS FOR RIVETED CHAINS In Effect Jan. 1, 1907

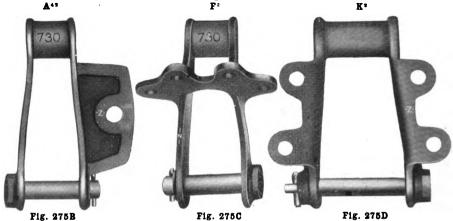
| No. 60 | No. 74 Cont. | No. 78-Cont. | No. 82-Cont. | No. 95-Cont. |
|--------|------------------|-------------------|--------------|--------------|
| A | M^3 45 | G^6 | NN60 | B75 |
| A1 | NN | G^{19} | N | F2 |
| B | N35 | | | NN60 |
| F^1 | | $K^{1}A$ | | No. 108 |
| NN | | M^3 | | A80 |
| No. 73 | B 40 | NN | | B |
| A50 | | N | | F^2 |
| B | | NN±50 | | No. 124 |
| F1 | N | N11 | B | |
| NN | No. 78 | No. 82 | F1 | B1.00 |
| N | A 60 | A70 | F285 | F1 1.00 |
| No. 74 | B | A1 | NN | M^3 |
| A45 | \mathbf{E}^{1} | | N80 | |
| B55 | | | | |
| F^1 | | | No. 95 | |
| H 45 | G Swivel55 | G ⁶ 70 | A | |

CLOSED END PINTLE CHAIN AND ATTACHMENTS

No. 730 CHAIN







 CHAIN

 Number
 710
 730
 744

 Price, Plain Links
 per foot
 .82
 .75
 1.00

ATTACHMENTS FOR No. 730 CHAIN

| Number | | A 42 | F ₂₃ | G ⁶ | K² |
|--------|----------|------|-----------------|----------------|------|
| Price | per foot | 1.05 | 1.35 | 1.35 | 1.25 |
| " Pins | each | .08 | .08 | .08 | .08 |

SPROCKET WHEELS

| | No. 71 | 0 | | No. 73 | 30 | No. | 730 | CONT. | No. 744 - CONT. | | | |
|--------------------------|-----------------|---------------|--------------------------|-----------------|---------------|--------------------------|-----------------|---------------|--------------------------|-----------------|---------------|--|
| Pitch Diam. Inches | No. of Teeth | Price Each | Pitch Diam. Inches | No. of Teeth | Price Each | Pitch Diam. Inches | No. of Teeth | Price Each | Pitch Diam. Inches | No. of Teeth | Price Each | |
| 163/4 | 11 | 9.00 | 153/4 | 8 | 9.10 | 341/6 | 18 | 24.00 | 171/2 | 9 | 12.10 | |
| 1814 | 12 | 9.90 | 171/2 | 9 | 10.40 | 361/5 | 19 | 26.10 | 191/2 | 10 | 13.70 | |
| 211/4 | 14 | 12.00 | 191/2 | 10 | 11.70 | 383% | 20 | 28.00 | 23 | 12 | 16.80 | |
| 2414 | 16 | 14.00 | 23 | 12 | 14.30 | 42 | 22 | 31.80 | 29 | 15 | 21.80 | |
| 301/4 | 20 | 18.50 | 25 | 13 | 15.80 | 493/4 | 26 | 42.60 | 341/2 | 18 | 28.60 | |
| 36 | 24 | 24.00 | 27 | 14 | 17.30 | 54 | 28 | 47.50 | | | | |
| 42 | 28 | 29.30 | 28% | 15 | 18.75 | , | No. 74 | 14 | | | | |
| 48 | 32 | 37.00 | 3034 | 16 | 20.20 | 1534 | 8 | 11.00 | | | | |

Nos. 710 and 730 have bore $3\frac{15}{16}$ -inch and under. No. 744 has bore $3\frac{15}{16}$ -inch and under. See list of extras on sprocket wheels.

MAXIMUM SILENT CHAIN GEAR

50 H. P. SILENT CHAIN DRIVE

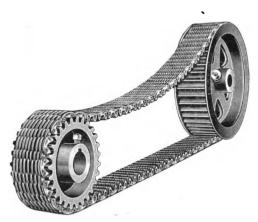
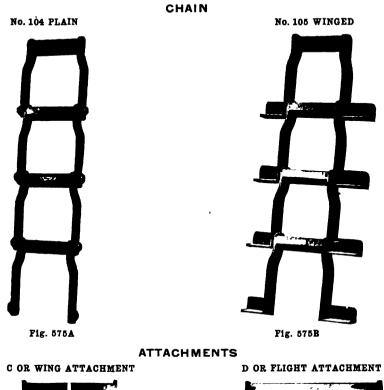


Fig. 5817A

| Pitch Inches | Outside Width Inches | Working Load without Shock Pounds | Wheel Width Flanged or Not Inches | Pitch Inches | Outside Width Inches | Working Load without Shock Pounds | Wheel Width Flanged or Not Inches |
|-----------------|---|---|--|-----------------|----------------------------|---|---|
| | 1.4 | 24 | 1!8 | | 2 | 316 | 2 ³ / ₄ 3 ¹ / ₄ 3 ³ / ₄ 4 ³ / ₄ 5 ³ / ₄ |
| | $\frac{1}{3}\frac{2}{4}$ | 36 | 13. | | $\frac{21}{3}$ | 395 | $3\frac{1}{4}$ |
| į į | 124 . | 48 | | 1 | 3 | 474 | 3 34 |
| 1∕2≺ | 11/ | 60 | 178 | | 4 | 632 | 43/4 |
| 721 | 11/4 | 72 | 91 | | 5 | 790 | $5\frac{3}{4}$ |
| į. | 972 | 96 | 458 957 | ! | | | |
| i | $ \begin{array}{c} 114 \\ 112 \\ 2 \\ 3 \end{array} $ | 144 | 15 % 178 21 8 25 8 35 % | , [] | $\overset{11}{2}$ | 316 | 2 t 8 3 1/2 4 5 6 7 |
| U | J | 133 | 978 | 1 | 2^{r-1} | 422 | 3 |
| _ | | | | 1 | $\frac{21}{2}$ | 527 | $3\frac{1}{2}$ |
| () | 34 | 57 | $\frac{13}{15}$ 8 | -1!44 | 3 | 633 | 4 |
| 1 (| 1 | 76 | 15/8 | 1 | 4 | 844 | 5 |
| 11 | 114 | 95 | $\frac{178}{236}$ | . 1 | 4 5 | 1055 | 6 |
| 58₹ | $ \begin{array}{c} 1_{12} \\ 1_{34} \\ 2 \\ 3 \end{array} $ | 114 | $2\frac{3}{16}$ | i il | 6 | 1266 | 7 |
| , il | 134 | 133 | $\frac{276}{2^{11}6}$ | ` | | | |
| i l | 2 | 152 | 2^{n}_{16} | () | 2 | 607 | 3 |
| i l | 3 | 228 | 3 ¹¹ 16 | · | $\frac{2}{3}$ | 911 | 4 |
| ` | | 1 | | 11/2 | 4 | 1214 | 5 |
| را | 3⁄4 | 70 | 15 💰 | 12 | 4 5 | 1518 | 3 4 5 6 9 |
| 11 | 1 | 94 | $1\frac{7}{8}$ | · il | 8 | 2428 | 9 |
| i 1 | 114 | 117 | 2^{1} | . 1 | | | |
| ! ! | 11/2 | 141 | 23% | | 6 | 2250 | 7.5. |
| 34 { | $13\sqrt{4}$ | 164 | 211 | 10/ | - 8 | 3000 | 93. |
| 1.1 | 2 | 188 | 27% | 134 { | 10 | 3750 | 11.2 |
| - 11 | 3 | 282 • | $37\frac{\circ}{8}$ | | $\tilde{1}\tilde{2}$ | 4500 | $7_{16}^{5},\ 9_{16}^{5},\ 11_{16}^{5},\ 13_{16}^{5}$ |
| - 11 | 11/2 13/4 2 3 4 | 376 | 378 478 | , | | | 16 |
| 4 | | | <i>,</i> 0 | $^{\circ}$ | 6 | 2500 | 7.5. |
| | 1 | 158 | 13/ | 2 | Ř | 3300 | 0 5 |
| 1 } | 11.2 | 237 | $\frac{134}{214}$ | - 1 | 8 10 | 4166 | $7\frac{5}{10}$ $9\frac{5}{10}$ $11\frac{5}{6}$ |

RIVETED SAWDUST CHAIN AND ATTACHMENTS



C OR WING ATTACHMENT D OR FLIGHT ATTACE Fig. 575C Fig. 575D

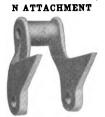


Fig. 575E

The above engravings are all shown in reduced size.

RIVETED SAWDUST CHAIN, ETC.

RIVETED SAWDUST CHAIN

These chains may be used all plain links, all attachments, or any proportion of plain and attachment links mixed.

REVISED PRICE LIST In Effect Jan. 1, 1907

| No. | Pitch Inches | Diameter of Pin Inches | Height Inches | Width | Working Strain Pounds | Price per Foot | Description |
|-------------|-----------------|------------------------------|------------------|-------|-----------------------------|----------------------|----------------------------|
| 97 Plain | 5 | 9 16 | 13/8 | 6 | 5000 | .55 | Plain) Wash to seth as |
| 97 Flight | 5 | 9 16 | 3 | 6 | 5000 | .60 | Flight & Work together |
| 98 Plain | 5 | 5/8 | 11/2 | 7 | 6000 | .65 | Dloim) |
| 98 Flight | 5 | 5/8 9 16 | 3 | 7 | 6000 | .75 | Flight \ Work together |
| 100 Plain | 5 | 9 | 13/8 | 9 | 5000 | .65 | Dlain) |
| 100 Flight | 5 | 16 | 23/4 | 9 | 5000 | .70 | Flight Work together |
| 101 Wing | 5 5 | 5/8 | 11/2 | 12 | 6000 | .85 | Wing, works with No. 98 |
| 102 Plain | 5 | 5/8 | 11/2 | 9 | 6000 | .75 | Plain) |
| 102 Flight | 5 | 5/8 | 23/4 | 9 | 6000 | .80 | Flight Work together |
| 103 Wing | 5 | 5/8 | 11/2 | 14 | 6000 | .90 | Wing, works with No. 102. |
| 104 Plain | 6 | 5/0 | 11/2 | 7 | 6000 | .65 | Plain |
| 104 Flight | 6 | 5/8 5/8 | 3 | 7 | 6000 | .70 | Flight |
| 104 N | 6 | 5/8 | 31/2 | 7 | 6000 | .70 | Attachment |
| 104 N 1 R&L | 6 | 5/8 | 31/2 | 7 | 6000 | .70 | Attachment |
| 105 Wing | 6 | 5% | 11/2 | 12 | 6000 | .80 | Wing, works with No. 104. |
| 110 Plain | 6 | 5/8 5/8 | 15/8 | 12 | 6000 | 1.00 | Plain |
| 110 Wing | 6 | 5/8 | 15/8 | 171/2 | 6000 | 1.20 | Wing |
| 110 N | 6 | 5/8 | 31/2 | 12 | 6000 | 1.10 | Attachment |
| 110 N1R&L | | 5/8 | 31/4 | 12 | 6000 | 1.10 | Attachment |
| 111 Flight | 6 | 5/8 | 3 | 12 | 6000 | 1.15 | Flight, works with No. 110 |
| 112 Plain | 8 | 5/8 | 11/2 | 12 | 6000 | .90 | Plain |
| 120 Plain | 6 | 3/4 | 2 | 12 | 8000 | 1.70 | D1 |
| 121 Flight | 6 | 3/4 3/4 | 33/4 | 12 | 8000 | 1.80 | Flight Work together |

No. 550 CHAIN



Fig. 121A

This is a detachable chain used for horizontal conveyors in sugar works, sawmills, cement plants, etc. The links are 7 inches wide, have 6-inch pitch; ultimate strength, 5000 pounds. Price per foot, 50 cents.

STEEL DRAG CHAIN



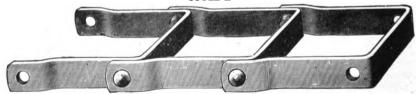


Fig. 7425A



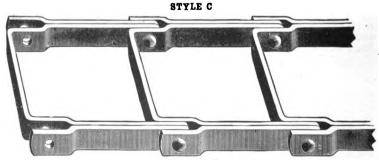


Fig. 7425C

| Number | 560 | 565 | 566 | 570 | 590 |
|------------------------|---------------------------|----------------------------|---------------------------|------------------------|---------------------------|
| Pitch | 6 73/8 77/8 83/8 | 8 87/8 95/8 103/8 | 8 83/8 87/8 95/8 | 10 12½ 13 13¾ | 10 18 1914 201/2 |
| Size of Side Bar " | 11/4 X 1/4 | 13/8×3/8 | 11/2X1/4 | 11/2 x 3/8 | 13/8X5/ |
| Price, Style Aper foot | .40 | .55 | .45 | .55 | 1.05 |
| " " B " | .60 | .85 | .65 | .80 | 1.40 |
| " " C | .70 | .95 | .75 | .90 | 1.50 |

This style Drag Chain is especially desirable for handling refuse, sawdust, etc. Also for coal and similar material.

MALLEABLE ROLLER BUSHED CHAIN

CHAIN



Fig. 345A

ATTACHMENTS

WITH F' ATTACHMENT WITH SELF-OILING PLANGED ROLLER PIVOTED G ATTACHMENT G ATTACHMENT







Fig. 345C



Fig. 345D

DIMENSIONS

| No. | Pitch Inches | Face of Roller, Inches | Diameter of Rotter, Inches | Diameter of Piu, Inches | Ultimate Strength Pounds | |
|-----|-----------------|---------------------------|-------------------------------|----------------------------|-----------------------------|--|
| 3 | 3 | 1 | 15 \$ | 1., | 12000 | |
| 4 | 4 | 1^{q} | 134 | 1.5 | 12000 | |
| 6 | ថ | 1 3 | 237 | 5 🖁 | 24000 | |
| - | | | | _ | | |

PRICE LIST

| No. | Pitch | Plain Links | | | | | | | | | | |
|-------------|-------------|----------------------|----------------|----------------|--------------|--|------|--------------|--|--|--|--|
| | Inches | per Foot | Λ^{11} | Λ^{42} | 1.7 | G" (.19 | K1 | K 2 | | | | |
| 3 4 6 | 3 4 6 | 2.30 1.60 2.10 | 1.70 2.20 | 4,00 | 2.55 2.10 | $\begin{array}{c c} 2.60 & 2.65 \\ 1.85 & 1.75 \\ 2.50 & 2.35 \end{array}$ | 2.60 | 1.80 2.40 | | | | |

This chain is made with a case hardened steel bush and so constructed that each

pair of side bars with its roller, forms a permanent link.

It is easily detachable, and the rollers actually roll. Attachments, A⁽¹⁾, A⁽²⁾, F², G⁶, G¹⁰, K¹ and K². All sizes same general design as illustration.



SPECIAL COMBINATION CHAIN

SHOWN IN REDUCED SIZE

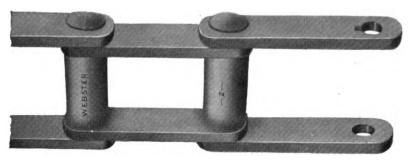


Fig. 367A

| Nun | aber | | | | | | | 102 | 1021/2 | 110 | 111 | 131 | 132 | 188 |
|------|---------------------|--------|---------|--------|--------|-------|----------|-------|--------|-------|-------|-------|----------|-------|
| | | | | | | | inches | 4 | 4 | 6 | 4.7 | 3 | 6 | 2.6 |
| Dia | meter | of Pi | n | | | | 44 | 1/2 | 3/4 | 5/8 | 3/4 | 5/8 | 1 | 1/2 |
| Ave | rage | Illtim | ate S | trens | rth | | .pounds | 14000 | 20000 | 18000 | 20000 | 18000 | 32000 | 12000 |
| Pric | Pl | ain C | hain . | orcing | , | | per foot | .60 | .88 | .60 | .85 | .70 | 1.30 | .50 |
| - 66 | | | 2nd. | Link | Ass | mbled | 16 | | 1.25 | | 1.10 | .95 | | .65 |
| 44 | F^2 | " | 4th. | 66 | , 1100 | er . | 44 | | 1.10 | | 1.00 | .82 | | .60 |
| | F^2 | 46 | 6th. | 44 | | | 66 | | 1.00 | | .95 | .78 | | .55 |
| 66 | G^1 | 44 | 2nd. | 46 | | | 44 | | 1.00 | | 1.00 | .90 | | |
| 66 | G^1 | 66 | 4th. | 44 | | " | 44 | | | | .95 | .80 | | |
| 66 | G^1 | 46 | 6th. | 44 | | 44 | ** | | | | | .75 | | |
| 66 | Go | 44 | | 66 | | " | 44 | | | | .90 | .90 | | .65 |
| 44 | G ⁶ | | 2nd. | 44 | | | " | | | | 1.00 | .80 | | |
| 44 | | ** | 4th. | 66 | | 66 | ** | | | | .95 | | | .60 |
| | G^6 | 66 | 6th. | 44 | | " | ** | | | | .90 | .75 | Y 20 - 5 | .55 |
| ** | K^1 | | 2nd. | 46 | | 44 | ** | | | | | .85 | | .60 |
| " | $\mathbf{K}^{_{1}}$ | ** | 3rd. | 44 | | | " | | | | | .85 | | .60 |
| 44 | $\mathbf{K}^{_{1}}$ | 44 | 4th. | | | | | | | | | .80 | | .55 |
| 66 | $\mathbf{K}^{_{1}}$ | ** | 5th. | 66 | | 64 | | | | | | .80 | | .55 |
| 44 | \mathbf{K}^{1} | ** | 6th. | 44 | | | ** | | | | | .75 | | .52 |
| 66 | All | K1 At | ttachr | nents | 3 | 4.6 | 44 | | | | | 1.05 | | |
| 44 | K^2 | Every | 2nd. | Link | 5 | | | .70 | 1.05 | .70 | 1.00 | | 1.50 | |
| 66 | K^2 | ** | 3rd. | 4. | | ** | 14 | .70 | 1.05 | .70 | 1.00 | | 1.50 | |
| 66 | K^2 | 44 | 4th. | 66 | | 4.6 | 66 | .66 | . 95 | .65 | .95 | | 1.40 | |
| 46 | K^2 | 44 | 5th. | 44 | | 66 | 4.6 | .66 | .95 | .65 | .95 | | 1.40 | |
| 44 | K^2 | 44 | 6th. | 66 | | 66 | 4.6 | .63 | .90 | .63 | .90 | | 1.35 | |
| 4.6 | A11 | K2 At | tachr | nents | 3 | 66 | ** | .80 | 1.35 | .90 | 1.40 | | 1.85 | |
| 46 | | | iks, M | | | 66 | each | .20 | .30 | .35 | .36 | .17 | .65 | .10 |
| 66 | F^{12} | 61 | | 44 | 66 | 66 | 46 | | .55 | | .55 | .30 | | .16 |
| 44 | G^1 | 66 | | 66 | 66 | 66 | 4.6 | | | | .48 | .27 | | |
| 66 | G^6 | | | 66 | 66 | 44 | 4.6 | | | | .48 | .27 | | .16 |
| 44 | K1 | 4 | | 14 | 66 | 11 | 44 | .26 | | | | .21 | | .14 |
| 66 | K^2 | 6 | 4 | 66 | 64 | 44 | 66 | .26 | .40 | .43 | .48 | 1 | .85 | |
| 66 | | plers | | 66 | 66 | 44 | 44 | .25 | | | .45 | .20 | .75 | |
| 44 | | | s, Stee | J | 44 | | 44 | .08 | .10 | .10 | .10 | .06 | .20 | 04 |
| 66 | K1 " | B Dar | s, Die | 31 | 44 | 44 | 44 | | 1 | | | .12 | | .04 |
| 66 | K2 66 | 66 | 44 | | | ** | 44 | .16 | .20 | 90 | **** | | 10 | .10 |
| 44 | 15 | | | | | | 44 | .16 | | .20 | .24 | | .40 | |
| | Pin | s (Wit | h Cot | ters) | Ste | el | | .04 | .07 | .04 | .08 | .05 | .15 | .03 |

STEEL ROLLER CHAIN, ETC. STEEL ROLLER CHAIN WITH BUSHINGS

WITH LINK CUT AWAY TO SHOW BUSHING



Fig. 368A

| | | | F16. 300A | | | |
|---|--|--|--|---|--|---|
| No. | Working Strain Pounds | Price per Foot | Width of Side Bar Inches | Thickness Side Bar Inches | Pitch of Link Inches | Diameter of Pin Inches |
| 129 17 27 27* 120 134 14 304 126D 574 576 112 127 | 1800 2000 2500 2500 2500 2500 2500 3500 35 | 1.60 1.80 1.80 1.80 1.80 2.00 2.00 1.80 2.00 1.75 3.00 3.00 2.75 | 114 13 x x 13 x x 13 x x 14 2 2 2 2 | 1 1 4 4 5 6 5 5 5 5 5 7 3 1 1 1 2 7 7 8 8 8 8 2 2 3 3 3 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 | 2.48 2.56 3 3 4 4 5 4 6 3.98 6 4 4 | 1.6 (2) 6 6 6 6 6 (2) 6 (2) 7 (2) 7 (4) 4 (4) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| 116 295 299 575 298 | 6000 6000 6000 8000 8000 | 2.50 2.50 3.50 3.75 3.25 4.25 | 2 2 2 2! \(\frac{2}{2} \) \(\frac{2}{3} \). | 1\2\2\2\3\8\5\5\5\5\5 | 6 6 3,28 5 8 6 | 34 34 34 34 34 78 |
| 117 | 15000 | 1 4.20 | 1 | 1 28 | 1 0 | 1 |

* Special price on application. Prices of sprocket wheels on application. We can furnish this chain without bushings if desired. Prices on application.

BEVEL TOP TRANSFER CHAIN No. 500 DETACHABLE No. 130 RIVETED





| Fig. 368B | | Fig. 3680 | |
|---|---------------|--------------|-------|
| Number | 500 | 130 | 131 |
| Diameter of Pin inches Average Ultimate Strength pounds | 13000 · 65 | 13000 .60 | 20000 |
| Priceper_foot | | | |



SPROCKET WHEELS

FOR DETACHABLE LINK CHAIN BORED, SET-SCREWED, OR KEY-SEATED

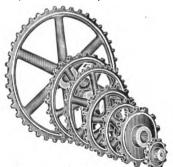


Fig. 1107A EXTRAS FOR BORES LARGER THAN STANDARD

| Listed Bore | | ADD to the LIST PRICE for LARGER BORES, INCHES | | | | | | | | | | | | | |
|--|--------|--|--------|------|--------|------|--------|------|--------|-------|-------|--|--|--|--|
| Inches | 115/16 | 27/16 | 215/16 | 37/6 | 315/16 | 47/6 | 415/16 | 57/6 | 515/16 | 67/6 | 615/6 | | | | |
| 17/6 | .25 | .62 | 1.12 | 1.75 | 2.50 | | | | | | | | | | |
| 111/16 | . 25 | .50 | 1.00 | 1.62 | 2.37 | | | | | | | | | | |
| $\frac{1^{15}}{2^{7}}_{16}$ | | .37 | .90 | 1.55 | 2.30 | 3.12 | | | | | | | | | |
| 27/6 | | | .50 | 1.40 | 2.40 | 3,40 | 4.50 | | | | | | | | |
| 215/16 | | | | .75 | 1.95 | 3.30 | 4.80 | 6.30 | | | | | | | |
| $\frac{2^{15}}{16}$ $\frac{3^{7}}{16}$ | | | | | 1.05 | 2.70 | 4.40 | 6.30 | 8.50 | | | | | | |
| 315/16 | | | | | | 1.35 | 3.50 | 5.70 | 8.20 | 10.80 | 14.60 | | | | |
| 476 | | | | | | | 1.50 | 3.80 | 6.30 | 9.00 | 11.00 | | | | |
| 415/16 | | | | | | | | 1.90 | 4.70 | 7.80 | 11,20 | | | | |

ADDITIONAL PRICE FOR SPLIT SPROCKET WHEELS

To be Added to List Prices of Plain Sprocket Wheels

| Number | Number of Teeth |
|-------------|---|
| of Chain | 4-7 8-1011-15 16-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-7 |
| 25 | 1.15 1.15 1.20 1.20 1.25 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.6 |
| 32 | [1] $[1.20]$ $[1.25]$ $[1.30]$ $[1.40]$ $[1.45]$ $[1.50]$ $[1.55]$ $[1.65]$ $[1.70]$ $[1.80]$ $[1.90]$ $[2.00]$ $[2.0]$ |
| 51 | 1 1.20 1.25 1.30 1.40 1.45 1.50 1.55 1.65 1.75 1.90 2.00 2.10 2.2 |
| 33-34-42 | |
| 52 | 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.25 2.45 2.60 2.80 3.0 |
| 35-45-55 | |
| 66 | $1 \dots 1.45 1.55 1.65 1.80 1.95 2.10 2.30 2.50 2.75 3.05 3.35 3.60 3.9$ |
| 62 | $[\dots] 1.50 $ $[1.60]$ $[1.75]$ $[1.90]$ $[2.10]$ $[2.25]$ $[2.45]$ $[2.65]$ $[2.95]$ $[3.25]$ $[3.55]$ $[3.85]$ $[4.16]$ |
| 57-67-77 | |
| 75-78-88 | |
| 103 | 1.90 2.20 2.70 3.30 4.00 4.75 5.50 6.10 6.75 7.45 8.10 8.75 10.0 |
| 83-93 | 1.65 2 05 2.70 3.50 4.30 5.15 5.90 6.80 |
| 114 | $1.65 2.05 2.70 3.10 4.30 5.15 6.00 6.95 7.90 \dots \dots \dots \dots $ |
| 85-95 | $\begin{bmatrix} 2.05 & 2.35 & 3.05 & 3.90 & 4.80 & 5.70 & 6.60 & 7.50 & 8.40 & 9.35 & \dots \end{bmatrix}$ |
| 124 | 2.10 2.70 4.00 4.20 4.90 6.60 7.40 8.40 9.45 10.45 11.50 12.55 13.60 14.7 |
| 108–110 | |
| 146 | 3.50 4.20 5.00 6.00 |
| 122 | 3.50 4.50 5.70 7.25 8.80 |

The cost of splitting Sprocket Wheels for Chains not listed will be in line with above list.

All Sprocket Wheels work in either direction.

SPROCKET WHEELS

| Diameter No. Price Inches Teeth Each Inches Teeth Inches No. 25 | | | 1 | No. 32 | 2 | N | 0.34 | · i | Nos. | 35, 45 | , 55 |
|--|-------------|----|------|-------------|--------|--------------|-----------------|--------------|------------|--------|--------|-------|
| 114 | Diameter | | | Diameter | No. | Price | Diameter | No. | Price | Diam. | No. | Price |
| 24 | | | | | | | | | | Inches | | |
| 24 | 11/4 | | | 614 | | | 314 | | | 21/2 | | |
| 24 | 11/2 | | | 7/4 | | 0.00 | 4/2 | | | 274 | | |
| Section Sect | 1% | 5 | | | | 2.00 | | | | 1 172 | 7 | |
| 11 | 91/ | | | 972 | | | 61/ | | | | 8 | |
| 11 | 274 | å | | | | 2.10 | | | 2 10 | 434 | | |
| 11 | 372 | | 1.20 | 834 | | 2.25 | | | | 51/4 | | |
| 12 | 31/ | | 1.30 | 934 | | 2.35 | 12 | | 2.70 | 6 | | |
| 13 | 31% | | | 10 | | 2.40 | *161/4 | | 3.30 | 61/2 | 12 | 2.20 |
| 14 | 334 | | | *111/4 | 30 | 2.60 | *201/6 | 45 | 4.00 | 7 | 13 | |
| 15 | | | 1.45 | *1134 | | 2.70 | *24 1/4 | 54 | 4.90 | 7½ | | |
| 16 | 41/6 | 15 | 1.50 | *12 | | 2.80 | | | | 73/4 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 434 | | 1.50 | *121/2 | 34 | | l | | | 81/4 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 5 | | | | | | N | o. 36 | ' 4 | 834 | | |
| 61½ 21 1.70 *16 43 3.40 *30½ 64 9.00 11 21 310 310 6½ 22 1.70 *16 43 3.40 *30½ 64 9.00 11 1½ 22 3.20 7 24 1.75 18½ 449 3.80 | 51/4 | | 1.55 | *14 | | 3.00 | | | | 91/2 | | |
| 10 | 534 | | 1.65 | 141/2 | | | 14 | 29 | 3.70 | | | |
| 11/2 23 3.20 3. | 614 | | 1.70 | | | | *3014 | | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 676 | | 1.70 | | | | 30/2 | | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 0% | | 1.75 | 101/ | | | | | 1 | | 93 | |
| 7½ 26 1.80 *22 59 5.00 7¾ 27 1.80 *22 59 5.00 8 28 1.85 *24 65 5.75 8¾ 30 1.90 1.90 2½ 5 1.20 3¼ 7 1.70 14½ 28 3.80 10¼ 35 2.10 2¾ 6 1.30 3¾ 7 1.70 15¼ 29 3.90 *11¼ 40 2.30 4¼ 9 1.45 4¼ 9 1.90 16¼ 31 4.10 1.50 4¾ 11 1.95 15¼ 30 4.00 12½ 42 2.10 1.50 4¾ 11 1.95 1.5¼ 30 4.00 12½ 43 2.45 5½ 11 1.60 5¼ 11 1.95 1.84 4.50 12½ 43 2.45 5½ 11 1.60 5½ < | 71/ | | | *201Z | | | l N | o. 42 | | | | 340 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 712 | | | | | | | | | | | 3.50 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 732 | | | | | 5.75 | | | | | | |
| 8¾ 30 1.90 2½ 5 1.20 3¾ 7 1.70 1.70 1.5¼ 29 3.90 1.0½ 35 2.10 2¾ 6 1.30 3¾ 8 1.80 1.5¾ 30 4.00 1.5¾ 31¼ 7 1.35 4¼ 9 1.90 1.5¾ 30 4.00 1.5¾ 31¼ 41 2.35 4¼ 9 1.45 4½ 10 1.95 1.6¼ 31 4.10 1.10 1.10 1.10 1.10 1.10 1.10 1.1 | 8 4 | | 1.85 | | · | | 21/4 | 5 | 1.50 | 14 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 834 | | 1.90 | | | | 234 | 6 | 1.60 | 141/6 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 101/4 | | 2.10 | 21/2 | | 1.20 | 314 | | | *151/4 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *101% | | | 2% | | 1.30 | | | | 153/ | 30 | |
| **11.34** 41 2.35 434 10 1.50 434 11 1.95 18 35 4.60 12½ 43 2.45 5½ 11 1.60 5¼ 12 2.00 183 $_4$ 36 4.70 12½ 44 2.55 5½ 12 1.70 5½ 13 2.05 19¼ 38 4.90 14 48 2.60 6½ 14 1.80 6½ 15 2.15 2.10 19¼ 38 4.90 14 48 2.60 6½ 14 1.80 6½ 15 2.15 2.10 20 39 5.10 15 52 2.80 7 15 1.90 7 16 2.20 21¾ 42 5.40 16¼ 56 3.00 8½ 19 2.20 8¼ 17 2.25 23¼ 45 6.00 16¼ 56 3.00 8½ 19 2.20 8¼ 19 2.35 24½ 46 6.20 18¾ 64 3.50 10 22 2.40 8¾ 42 2.45 24½ 47 6.35 42½ 47 6.35 42½ 47 6.35 42½ 47 6.35 42½ 47 4.25 11½ 26 2.60 9½ 22 2.50 29½ 57 8.00 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 6.50 42½ 48 4.50 42½ 48 4.50 42½ 48 4.50 42½ 48 4.50 42½ 48 4.50 42½ 48 4.50 42½ 48 4.50 42½ 48 4.50 42½ 44 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 42½ 4.50 4 | *111% | 40 | 2.30 | 31/4 | | 1.50 | | | | 1614 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *1134 | | | 43/ | | 1.50 | 43/ | | | *1734 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 12 | 42 | | 5 L' | | | 51/4 | | | 18 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 121/2 | | | 51% | | | 51% | | | 18% | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | 534 | | 1.75 | 61/4 | | | 19/4 | | |
| *16 | | | | 61/4 | | | 017 | 15 | 2.15 | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | | | 1.90 | 7 | | 2.20 | 213/ | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | -10 161/ | | | 71/4 | 16 | 2.00 | | | 2.25 | 2314 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *1612 | | | | | | 8 | | 2.30 | 24 | | 6.20 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 183/ | | | | | | 814 | | | 241/6 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | *20½ | | 3.80 | 10 | | | | | | 24 34 | 48 | 6 50 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 221/ | | 4.25 | 1034 | | | 11 24.5 | | 2.40 | 2734 | 54 | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 211% | | 5.00 | 111/2 | | | | | | 291/2 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | | *191/ | | | 1137 | | | *30 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 2 | | 1 15 | 141/ | | | *13 | | | 311/4 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 21/ | | 1 20 | 151/ | | 3.00 | 1317 | | | 3214 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 214 | | 1.25 | 161/ | | 3.30 | *141 | | | *20°1. | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3 3 | | 1.30 | *17 | | 3.50 | 153 | | | *13 | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 31% | | 1.35 | 181/6 | | | 1734 | | 4.00 | 40 | 02 | 14.00 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3¾ | | | 233/ | | | 20 | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 4 | 11 | 1.45 | 24 1/4 | 54 | | $21\frac{3}{4}$ | | | | lo. 48 | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 41/2 | | | *30 | | 5. 90 | *23 | | | | | |
| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | 5 | | 1.65 | | | | | | | - 01 / | | 0.46 |
| 6 16 1.85 *40½ 90 10.00 *36 82 12.00 11¾ 18 3.80 | 514 | | | | | | *2434 | | | 61/2 | | |
| | | | | *4 0 | | | 261/2 | | | | | |
| *Drive Wheel Where we works are indicated both driving and driven patterns | | 16 | | *40½ | 90 | 10.00 | | 1 | | | | |

^{*}Drive Wheel. Where no marks are indicated both driving and driven patterns are made.

| | | | SPR | OC | KET | W F | 1EE | LS | | | |
|---------------------------|--------------|---------------|---------------------------------|--------------|---------------|-----------------|----------------|---------------|-----------------|----------------------|---------------|
| | No. 5 | 0 | r | lo. E | 2 | Nos. | 57 , 6 | 7,77 | 1 | 2 | |
| Diam. Inches | No. Teeth | Price Each | Diam. Inches | No. Teeth | Price Each | Diam. Inches | No. Teeth | Price Each | Diam. Inches | No. Teeth | Price Each |
| $\overline{}_2$ | 6 | 1.15 | 9 | 19 | 2.75 | 231/2 | 32 | 7.00 | *30 | 57 | 10.00 |
| $\overline{2}\frac{1}{2}$ | 8 | 1.20 | 934 | 20 | 2.80 | 2414 | 33 | 7.25 | 3034 | 58 | 10.20 |
| 23/ | 9 | 1.50 | 1014 | 21 | 2.90 | *2 5 | 34 | 7.50 | *3534 | 68 | 12.50 |
| 314 | 10 | 1.60 | 1034 | 22 | 3.00 | 261/2 | 36 | 8.00 | 48 | 91 | 20.00 |
| 4 | 12 | 1.70 | 11 | 23 | 3.10 | 28 | 38 | 8.60 | | Na o | ^ |
| 514 | 16 18 | 2.00 | $12\frac{1}{4}$ $12\frac{1}{4}$ | 25 26 | 3.20 3.30 | *2834 291/2 | 39 | 8.90 | lf. | No. 6 | 6 |
| 5¾ 6 | 19 | 2.10 | 13 13 | 27 | 3.40 | 3014 | 40 | 9.20 9.50 | 514 714 | 8 | 1.90 |
| 81/4 | 26 | 2.60 | 14 | 29 | 3.50 | 32 | 43 | 10.10 | $\frac{714}{4}$ | 11 | 2.20 |
| 1014 | 31 | 2.90 | 141/2 | 30 | 3.60 | *32,4 | 44 | 10.10 | 812 | 13 | 2.50 |
| 101% | 32 | 3.00 | 1514 | 31 | 3.70 | 3334 | 46 | 11.25 | *101/2 | 16 | 2.80 |
| *1214 | 38 | 3.30 | *1534 | 32 | 3.80 | 36 | 49 | 12.20 | *1614 | 25 | 4.00 |
| 15 | 47 | 3.90 | 161/2 | 34 | 4.00 | *3814 | $\tilde{52}$ | 13.20 | *2934 | 46 | 8.80 |
| *25 | 78 | 5.90 | 18 | 37 | 4.20 | *3914 | 53 | 13.55 | | - 76 | |
| | | | 19 | 39 | 4.50 | 40 | 54 | 13.90 | | 0.76 |) 12 |
| ı | No. 51 | 1 | *191/2 | 40 | 4.60 | *44 | 60 | 16.50 | 434 | 7 | 1.55 |
| 21/6 | 1 7 | 1.50 | 20 | 41 | 4.70 | *4434 | 61 | 17.00 | 8 | 13 | 2.15 |
| 2½ 3¼ | 9 | 1.60 | 2034 | 42 | 4.80 | 4734 | 65 | 18.50 | *12 | 18 | 3.10 |
| 31/2 | 10 | 1.65 | 2334 | 49 | 5.60 | | | | Non | 75 7 | 0.00 |
| 3¾ | 11 | 1.70 | 241/2 | 50 | 5.70 | N | lo. 62 | 2 | , | 10, 1 | 8,88 |
| 41/2 | 12 | 1.75 | *2514 | 52 | 6.00 | | | | 41/2 | 5 | 2.40 |
| 5 | 14 | 1.85 | †2534 | 53 | 6.20 | 314 | 6 | 1.75 | $5)\frac{7}{4}$ | 6 | 2.60 |
| $5\frac{1}{2}$ | 15 | 1.90 | 2734 | 57 | 6.40 | 3% | 7 | 1.85 | 6 | 7 | 2.80 |
| 6 | 16 | 1.95 | 30 | 62 | 7.40 | 414 | 8 | 1.95 | 634 | 8 | 3.00 |
| 61/2 | 17 | 2.00 | 31 | 64 | 8.00 | 434 | 9 | 2.05 | 734 | 9 | 3.20 |
| 71% | 20 | 2.15 | 36 | 74 | 12.50 | 51/6 | 10 | 2.15 | 1 81/6 1 | 10 | 3.45 |
| 814 | 22 | 2.25 | Nos. 5 | 7 6 | 7 77 | 5^{3} | 11 | 2.25 | 914 | 11 | 3.70 |
| 914 | 25 | 2.40 | l | | | 61/2 | 12 | 2.40 | 1014 | 12 | 3.95 |
| 934 | 27 | 2.50 | 4 | 5 | 1.80 | 6^{3} | 13 | 2.55 | 11 | 13 | 4.20 |
| 1112 | 31 | 2.75 | 41/2 | 6 | 1.90 | 71/2 | 14 | 2.70 | 12 | 14 | 4.50 |
| *11¾ *13 | 32 35 | 2.85 | 5 1/4 | 7 | 2.20 | 8 | 15 | 2.85 | 13 | 15 | 4.80 |
| *13 *14 | 38 | 3.00 3.10 | $\frac{614}{7}$ | 8 | 2.40 | 81/2 | 16 17 | 3.00 | 14 | 16 17 | 5.10 |
| *141/2 | 40 | 3.30 | 7½ | 9 | 2.60 2.80 | 9 91/2 | 18 | 3.10 | 14½ 15¼ | 18 | 5.50 5.80 |
| *1534 | 43 | 3.50 | 81/2 | 111 | 2.90 | 1014 | 19 | 3.20 3.35 | 161/2 | 19 | 6.20 |
| *17% | 48 | 3.80 | 9 9 2 | 12 | 3.10 | 101/2 | 20 | 3.50 | 1634 | 20 | 6.60 |
| *181/2 | 50 | 4.10 | 10 | 13 | 3.25 | *1114 | 21 | 3.60 | 171/2 | 21 | 7.00 |
| 20 | 54 | 4.75 | 101/3 | 14 | 3.40 | 1134 | 22 | 3.80 | 181/2 | $\tilde{2}\tilde{2}$ | 7.30 |
| *22 | 60 | 5.50 | 11 | 15 | 3.55 | 12 | $\frac{1}{23}$ | 4.00 | 1914 | 23 | 7.70 |
| | | | 12 | 16 | 3.70 | $12\frac{3}{4}$ | 24 | 4.15 | 201% | 24 | 8.00 |
| | No. 52 | 2 | 1216 | 17 | 3.85 | 13^{12}_{2} | 25 | 4.30 | 21 | 25 | 8.30 |
| 3 | 6 | 1.50 | 131/4 | 18 | 4.00 | 1414 | 27 | 4.50 | 22 | 26 | 8.60 |
| 31/2 | 7 | 1.60 | 141/4 | 19 | 4.20 | 141/2 | 28 | 4.70 | $22\frac{1}{2}$ | 27 | 8.90 |
| 4 | 8 | 1.70 | 15 | 20 | 4.40 | 16 | 30 | 5.10 | 231/6 | 28 | 9.20 |
| 41/2 | 9 | 1.80 | 1534 | 21 | 4.60 | *17 | 32 | 5.40 | 2414 | 29 | 9.50 |
| 5 | 10 | 1.90 | 16 | 22 | 4.80 | 18 | 34 | 5.60 | $25\frac{1}{2}$ | 30 | 9.80 |
| 51/2 | 11 | 2.00 | 17 | 23 | 5.00 | 201/2 | 38 | 6.20 | 2634 | 32 | 10.25 |
| 6 | 12 | 2.10 | 1734 | 24 | 5.20 | *21 | 39 | 6.35 | 2734 | 33 | 10.70 |
| $6\frac{1}{4}$ | 13 | 2.20 | 19 | 25 | 5.40 | *2134 | 41 | 6.60 | 2812 | 34 | 11.10 |
| 634 | 14 | 2.30 | *191/2 | 26 | 5.60 | *2214 | 42 | 6.80 | 2917 | 35 | 11.50 |
| 73/ | 15 16 | 2.40 | 20 | 27 | 5.85 | 2234 | 43 | 7.00 | 3014 | 36 | 11.90 |
| 734 | | 2.50 | 201/2 | 28 | 6.10 | 2334 | 45 | 7.40 | 3114 | 37 | 12.40 |
| 81/4 | 17 | 2.60 | 2114 | 29 | 6.30 | 2534 | 49 | 8.30 | 32 | 38 | 13.00 |

SPROCKET WHEELS

| Nos. 7 | 75,70 | 8, 88 | N | lo. 103 | | N | o. 10 | 8 | _ | lo. 122 | 2 |
|--------------------|--------------|----------------|--------------------|---------------------|----------------|--------------------|--------------|----------------|--|--------------|----------------|
| Diameter Inches | No. Teeth | Price Each | Diameter Inches | No. Teeth | Price Each | Diameter Inches | No. Teeth | Price Each | Diameter Inches | No. Teeth | Price Each |
| 3334 | 40 | 13.90 | 6 | 6 | 3.60 | 934 | 6 | 5.20 | 16 | 8 | 9.75 |
| 36 | 43 | 15.00 | 7 | 7 | 4.00 | 121/2 | 8 | 6.20 | *18 | 9 | 10.80 |
| 37 | 44 | 15.90 | 8 | 8 | 4.40 | 14 | 9 | 7.25 | 20 | 10 | 12.80 |
| 37¾ | 45 | 16.50 | 9 | 9 | 4.80 | 151/2 | 10 | 8.00 | *22 | 11 | 14.60 |
| 381/2 | 46 49 | 17.10 | 10 11 | 10 11 | 5.25 5.65 | 1714 1814 | 11 12 | 9.00 9.90 | 2334 | 12 | 16.50 |
| 41¼ 42 | 50 | 19.00 19.70 | 12 | 12 | 6.05 | 2014 | 13 | 10.90 | *29½ *31½ | 15 16 | 21.80 23.60 |
| 48 | 57 | 24.50 | 13 | 13 | 6.45 | *2112 | 14 | 11.80 | 37 | 19 | 30.00 |
| *501/ | 60 | 26.00 | 14 | 14 | 6.85 | 25 | 16 | 14.00 | *4834 | 25 | 40.00 |
| *541/4 | 65 | 28.00 | 15 | 15 | 7.25 | 301/2 | 20 | 18.50 | *71 | 36 | 70.00 |
| *6 0¼ | 72 | 30.00 | 16 | 16 | 7.65 | 37 | 24 | 24.00 | | | |
| 641/ | 77 | 33.50 | 17 | 17 | 8.08 | *4214 | 28 | 29.30 | | | |
| 67 | 80 | 40.00 | 1734 | 18 | 8.45 | 4414 | 29 31 | 33.00 | _ | | |
| N | o. 83 | 3 | 18¾ 19¾ | 19 20 | 8.90 9.40 | 471% | 1 91 | 36.00 | , r | lo. 124 | |
| 6¾ | 5 | 3.50 | 2034 | 21 | 10.00 | | | | 1034 | 8 | 6.20 |
| 8 | 6 | 4.00 | 2134 | 22 | 10.35 | | | | 12 | 9 | 6.90 |
| | 7 | 4.50 | 2234 | 23 | 10.80 | N | lo. 11 | 4 | 131/4 | 10 | 7.70 |
| 914 1012 | 8 | 4.65 | 23½ 24¾ | 24 25 | 11.20 | 51/ | , E | 3.60 | 14¾ 16 | 11 12 | 8.50 9.40 |
| 12 | 9 | 4.80 | 2534 | 26 | 11.70 12.25 | 5½ 6¾ | 5 6 | 4.00 | 171/ | 13 | 10.20 |
| *141/4 | 11 | 5.50 | 2634 | 27 | 12.75 | 71/2 | 7 | 4.25 | 171/4 181/4 | 14 | 11.00 |
| 151/ | 12 | 6.30 | 273/2 | 28 | 13.30 | 81% | 8 | 4.50 | 19% | 15 | 12.00 |
| 18 | 14 | 7.40 | 2834 | 29 | 13.80 | 934 |) ğ | 4.95 | 21 | 16 | 13.00 |
| 2014 | 16 19 | 8.30 | 291/2 | 30 | 14.40 | 10% | 10 | 5.20 | 221/2 | 17 | 14.20 |
| 24¼ 25¼ | 20 | 10.20 10.90 | 301/2 | 31 | 15.20 | 1134 | 11 | 5.65 | 231/2 | 18 | 15.20 |
| 301 | 24 | 14.20 | 311/2 | 32 | 16.00 | $12^{3}4$ | 12 | 6.10 | 25 | 19 | 16.20 |
| 35¾ | 28 | 17.00 | 321/2 | 33 | 16.80 | 13¾ | 13 | 6.55 | 26 | 20 | 17.30 |
| 481/2 | 38 | 38.00 | *33½ 35½ | 34 36 | 17.60 19.25 | 15 16 | 14 15 | 7.00 7.50 | 29 30 | 22 23 | 19.50 20.60 |
| | . 85, | 0.E | 35½ 36½ | 37 | 20.00 | 17 | 16 | 8.00 | 311/4 | 24 | 21.70 |
| | | | 371/2 | 38 | 21.20 | 19 | 18 | 9.20 | 361/6 | 28 | 26.10 |
| 7 | 5 | 3.50 | 391/4 | 4C | 23.10 | 20 | 19 | 9.80 | 3914 | 30 | 28.50 |
| 8 | 8 | 4.00 5.00 | 401/2 | 41 | 24.00 | 22 | 21 | 11.10 | 4134 | 32 | 30.80 |
| 10¼ 11¾ | 9 | 5.50 | 441/2 | 45 46 | 27.00 28.20 | 24 | 23 | 12.50 | *4414 *481⁄2 | 34 | 33.00 |
| 13 | 10 | 6.05 | *45½ 48 | 49 | 30.75 | 25 †26½ | 24 25 | 13.10 15.00 | *4934 | 38 | 38.00 |
| 141/4 | 11 | 6.50 | 54 | 55 | 35.00 | 31 | 30 | 17.50 | *60 | 46 | 50.00 |
| 151/2 | 12 | 6.95 | * 57 | 58 | 38.00 | *33¾ | 32 | 19.30 | *6634 | 51 | 58.00 |
| 1634 | 13 | 7.40 | 66 | 67 | 46.00 | | 34 | 21.10 | *73 | 56 | 66.00 |
| 1814 | 14 | 7.85 | *71¾ | 73 | 60.00 | 361/2 | 35 | 22.00 | *86 | 66 | 80.00 |
| *1914 | 15 | 8.40 | | | | *38 | 36 | 23.00 | | | |
| 21 23 | 16 | 8.80 10.25 | | | | 40 | 38 | 24.00 | | | |
| 20 241/ | 18 19 | 11.00 | No. | o. 104 ³ | 4 | 4414 | 42 | 27.00 | _ | | |
| 241/2 263/4 | 21 | 12.50 | 10 | 7 | 4.50 | *60 | 57 | 60.00 | , r | lo. 146 | • |
| *2 8 | 22 | 13.60 | †13 | 9 | 7.70 | | | | 161/4 | 1 8 | 12.00 |
| 291/4 | 23 | 15.00 | 1534 | 11 | 8.50 | | • | | *18¼ | 9 | 12.65 |
| 33 | 26 | 17.15 | *20 | 14 | 12.00 | _ n | No. 121 | | 201/2 | 10 | 13.70 |
| 341/2 | 27 | 18.25 | *2134 | 15 | 13.00 | | | | $ 24\frac{1}{2}$ | 12 | 17.00 |
| *4034 | 32 | 25 00 | 2434 | 17 | 16.00 | *1734 | 9 | 8.00 | 2934 | 15 | 20.00 |
| *48½ *59 | 38 | 30.00 | *3014 *473 | 21 | 20.00 | 1934 | 10 | 9.80 | *36 ¹ / ₄ *72 | 18 36 | 24.00 65.00 |
| ~ 09 | 41 | 45.00 | *4734 | 33 | 37.00 | *271/2 | 14 | 16.00 | 1 *12 | 30 | 00.00 |

^{*} Driven wheel. † Driving wheel. Where no marks are indicated, both patterns are made.

SPROCKET WHEELS FOR LEY BUSHED CHAIN BORED AND KEY-SEATED OR SET-SCREWED



Fig. 241A

| | No. 823 Bore 215-inch | 1 | | 825 CO fore 315-incl | | Nos. 840, 841 and 84 CONT. *Bore 3\frac{1}{6}-inch | | | |
|-------------------------------|--------------------------|---------------|-----------------------------|-------------------------|---------------|--|------------------------|---------------|--|
| Pitch Diameter Inches | Number of Teeth | Price Each | Pitch Diameter Inches | Number of Teeth | Price Each | Pitch Diameter Inches | Number of Teeth | Price Each | |
| 101/2 | 8 | 5.90 | * 201/2 | 16 | 14.00 | 23 | 12 | 17.50 | |
| $12\frac{15}{16}$ | 10 | 7.00 | 2134 | 17 | 15.00 | †C 25 | 13 | 20.00 | |
| 141/4 | 11 | 7.50 | 23 | 18 | 16.00 | 29 | 15 | 24.00 | |
| 151/2 | 12 | 8.00 | 305/8 | 24 | 22.50 | 341/2 | 18 | 32.00 | |
| 18 | 14 | 9.00 | 36 | 28 | 28.20 | | N- 044 | | |
| 191/4 | 15 | 9.70 | 391/2 | 31 | 31.50 | *Bo | No. 844 ore 31 inch | 1 | |
| $20\frac{1}{2}$ | 16 | 10.50 | | No. 835 | | †C 171/2 | 9 1 | 15.00 | |
| 213/4 | 17 | 11.30 | | ore 315-inch | 1 | †C 191/2 | 10 | 16.80 | |
| $\frac{24\frac{5}{16}}{9516}$ | 19 | 12.80 | 141/4 | 11 | 12.00 | †C 23 | 12 | 20.00 | |
| $\frac{251}{2}$ | 20 | 13.70 | 163/4 | 13 | 13.75 | †C 25 | 13 | 22.00 | |
| 305/8 | 24 | 17.50 | 1914 | 15 | 15.75 | 29 | 15 | 26.00 | |
| 36 | 28 | 22.00 | 241/2 | 19 | 20.50 | 341/2 | 18 | 32.50 | |
| $48\tfrac{7}{16}$ | 38 | 34.00 | 251/2 | 20 | 21.80 | +C 36 % | 19 | 35.00 | |
| No. 825 | | | 291/2 | 23 | 25.75 | | No 947 | | |
| *Bore 315-inch | | | 305/8 | 24 | 27.00 | No. 847 *Bore 415-inch | | | |
| 113/4 | 9 | 8.40 | 36 | 28 | 34.00 | †C 23½ | 12 | 24.00 | |
| 151/2 | 12 | 10.50 | Nos 84 | 10, 841 A | ND 843 | 291/2 | 15 | 34.00 | |
| 18 | 14 | 12.00 | | ore 315-incl | | +C 361/2 | 19 | 48.00 | |
| 191/4 | 15 | 13.00 | 153/4 | 8 | 13.00 | | | | |

Additional price to be added to list for split sprocket wheels.

| No. of | NUMBER OF TEETH | | | | | | | | | | | |
|--------|-----------------|----------|----------|----------|----------|----------|----------|--|--|--|--|--|
| Chain | 8 to 10 | 11 to 13 | 14 to 16 | 17 to 19 | 20 to 24 | 25 to 29 | 30 to 31 | | | | | |
| 823 | 3.50 | 4.00 | 4.50 | 5.00 | 5.80 | 6.60 | | | | | | |
| 825 | 4.10 | 4.50 | 5.10 | 5.50 | 6.40 | 7.30 | 8.40 | | | | | |
| 835 | 4.50 | 5.00 | 5,60 | 6.50 | 8.70 | 8.60 | | | | | | |
| 840 | 5.50 | 6.40 | 7.30 | 8.20 | 7.50 | | | | | | | |
| 844 | 5.60 | 6.50 | 7.40 | 8.40 | | | | | | | | |
| 847 | | 10.00 | 12.00 | 13.00 | | | | | | | | |

*An extra charge is made for wheels having special hubs, or wheels bored larger than specified above on account of additional weight. See sprocket wheel extras. †Can be furnished chilled when desired. Special discount.

SPROCKET WHEELS FOR RIVETED SAWDUST CHAIN. ETC.



Fig. 86A
FOR RIVETED SAWDUST CHAIN

| | | | | | _ |
|--------------------------|----------------------------|----------------------|--------------------------|------------------------------|--------------------------------|
| 8%-inch Face | No. 97 CHA 5-inch Pitch | IN *2}}-inch Bore | Nos. 9 | 98 AND 101 (5-inch Pitch | CHAIN *2 {\frace4-lnch Bore |
| Pitch Diameter Inches | Number of Teeth | Price Each | Pitch Diameter Inches | Number of Teeth | Price Each |
| 97/8 | 6 | 3,50 | 91/4 | 6 | 4.10 |
| 113% | 7 | 4.40 | 113% | 7 | 5.00 |
| 13 | 8 | 5.00 | 13 | 8 | 5.60 |
| 163/8 | 10 | 7.00 | 163_{8} | 10 | 6.20 |
| 1934 | 12 | 10.00 | 193/4 | 12 | 7.40 |

| 61 11 | N nch Face | os. 100, 102 | AND 103 CHA | IN *3⅓-inc | h Rora |
|-------------------------|----------------------------|----------------------------------|------------------------|----------------|-------------------------|
| 97/8 113/8 | 6 7 | 4.70 5.60 6.20 | 163 g 1934 211/6 | 10 12 13 | 7.60 8.80 9.40 |
| Nos. 1 | 04 AND 105 6-inch Pitch | CHAIN | Nos. 110, 1 | 11, 120 AND | ' |
| 15½ 17½ 19½ 21 | 8 9 10 11 | 8.00 $ 9.00 $ $ 11.00 $ $ 12.00$ | 15½ 17½ 21 | 8 9 11 | 12.50 14.00 17.00 |

FOR TRANSFER CHAIN

| No. 500 DETACHABLE CHAIN *Bore 3/4-Inch | | | | | RIVETE | D CHAI | N | | |
|---|-----------------------|----------------------|-------------------------------|-----------------------|----------------------|------------|--------------------------------------|-----------------------|---------------|
| l'itch Diameter Inches | Number of Teeth | Price Each | Pitch Diameter Inches | Number of Teeth | Price Each | No. | Pitch Diameter Inch e s | Number of Teeth | Price Each |
| 7.91 10.38 11.61 | 12 16 18 | 4.40 5.60 6.00 | 12.85 14.08 15.32 | 20 22 24 | 6.75 7.50 8.00 | 130 131 | 12 12 | 9 9 | 5.50 7.00 |

^{*}An extra charge is made for wheels having special hubs, or wheels bored larger than specified above on account of additional weight. See list of extras for sprocket wheels.

SPROCKET WHEELS FOR MALLEABLE ROLLER BUSHED CHAIN, ETC.



Fig. 125A

FOR MALLEABLE ROLLER BUSHED CHAIN

NO. 3 CHAIN

* Bore 243-inch

* Bore 243-inch

| 5-Inch I Ich | | | BOIC Big-Inch | | | | |
|---------------------------|--------------------|---------------|---------------------------|--------------------|---------------|--|--|
| Pitch, Diameter Inches | Number of Teeth | Price Each | Pitch, Diameter Inches | Number of Teeth | Price Each | | |
| 934 | 10 | 6.00 | 2834 | 30 | 18.00 | | |
| 111/8 | 12 | 6.80 | 341/2 | 36 | 22.00 | | |
| 153/8 | 16 | 9.00 | 3834 | 40 | 26.0 0 | | |
| 191/8 | 20 | 11.60 | 45 | 48 | 34.00 | | |
| 23 ´° | 24 | 14.00 | 683/4 | 72 | 64.00 | | |

| | * Bore 3inch | | | | |
|--|--------------|-----------------------|----------------|--------------|----------------|
| $ \begin{array}{r} 9!4\\ 11!2\\ 19!2 \end{array} $ | 7 9 15 | 7.00 7.60 12.00 | 24½ 34¾ | 19 27 | 16.00 24 00 |

| | 6-inch Pitch | No. 6 | CHAIN | * Bore 3{}-inch | |
|----------------------------|--------------|-------|-------|-----------------|--------------|
| 12 | 6 | 8.60 | 287 3 | 15 | 22.00 |
| $\frac{15\frac{3}{4}}{17}$ | 8 | 10.00 | 3034 | 16 | 24.00 |
| 17 | 9 | 11.00 | 38% | 20 | 36 00 |
| 193/8 | 10 | 12.00 | 53 | 28 | 52.00 |
| 231_{8} | 12 | 16.00 | | | |

| | FOR No. 550 CHAIN | | | | | | | | |
|-------|-------------------|-------|-------|----|-------|--|--|--|--|
| 10.76 | 5 | 8.80 | 22.10 | 12 | 18.80 | | | | |
| 12.65 | 6 | 10.10 | 25.88 | 13 | 24.00 | | | | |
| 14.54 | 7 | 11.50 | 29.66 | 15 | 29.60 | | | | |
| 16.43 | 8 | 13.00 | 31.55 | 16 | 32.00 | | | | |
| 17.32 | 9 | 14.60 | 37.22 | 19 | 37.60 | | | | |
| 20.21 | 11 | 16.40 | 46.67 | 24 | 41.60 | | | | |

^{*} An extra charge is made for wheels having special hubs, or wheels bored larger than specified above, on account of additional weight. See list of extras on sprocket wheels.

TRACTION WHEELS FOR LEY BUSHED CHAIN

BORED AND KEY-SEATED OR SET-SCREWED



Fig. 6A

| No. *Bore 2 | | | o. 844 e 3¦}-Inch | |
|-----------------------------|---------------|-----------------------------|----------------------|--|
| Pitch Diameter Inches | Price Each | Pitch Dlameter Inches | Price Each | |
| 101/2 | 8.00 | 171/2 | 16.00 | |
| 13 | 8.80 | †C18´ * | 16.50 | |
| 1512 | 10.00 | 1914 | 17.00 | |
| 1914 | 12.00 | †C20´² | 18.00 | |
| $24\frac{1}{2}$ | 15.00 | 23 | 21.00 | |
| $30\frac{3}{4}$ | 20.00 | †C24 | 23.00 | |
| No. | 825 | 25 | 25.00 | |
| *Bore 3 | | †C29 | 28.00 | |
| | | †C30 | 34.00 | |
| 15^{1}_{2} | 11.00 | 3413 | 40.00 | |
| 18 | 13.00 | †C361/3 | 44.00 | |
| 1914 | 15.00 | · | | |
| $20\frac{1}{2}$ | 17.00 | | | |
| 23 | 19.00 | No. 8 | 847 | |
| 30¾ | 25.00 | *Bore 4 | }-inch | |
| Nos. 840, 8 | 41 AND 843 | | • | |
| *Bore 3 | la inch | †C18 | 20.00 | |
| 1537 | 14.00 | †C23½ | 24.00 | |
| $\frac{1534}{23}$ | 18.00 | †C29´2 | 40.00 | |
| 25 25 | 22.00 | 3614 | 52,00 | |

^{*}An extra charge is made for wheels having special hubs, or wheels bored larger than specified above, on account of additional weight. For prices see extras for sprocket wheels.

[†]Wheels marked "C" can be furnished chilled when desired. Special discount for split wheels the same diameters. Add extras as shown in list of split Ley bushed sprockets.

FINISHED TRACTION WHEELS FOR ELEVATORS



These wheels are made for use in elevators handling heavy or gritty material, the work that the teeth on the sprockets would be called upon to do being performed by traction.

At the same time in case of a serious obstruction, the chain is allowed to slip.

Elevators equipped with these wheels will run more smoothly and last longer in gritty material than they would if sprocket wheels were used.

All wheels have faces turned smooth.

Fig. 329A

| os. 85, 94, *Bore 2 | 95 AND 102 | Nos. 103 AN *Bore 3 | D 131—CONT | No. 114 *Bore 3 | |
|-----------------------------|-----------------------|-----------------------------|-----------------------|----------------------------------|---------------|
| Pitch Diameter Inches | Price Each | Pitch Diameter Inches | Price Each | Pitch Diameter Inches | Price Each |
| 12 | 7.55 | 181/2 | 10.85 | 22 | 14.75 |
| 13 | 8.10 | 20 2 | 12.50 | 24 | 18.10 |
| 14 | 8.65 | 24 | 14.50 | †C27½ | 20.00 |
| 153/4 | 9.65 | 30 | 21.80 | 30~ | 22.00 |
| 161/2 | 10.20 | | | 31 | 23.00 |
| 1734 | 10.90 | N 400 4 | 40 444 | 33 | 24.50 |
| 19 1 | 11.55 | | 10 AND 111 | 36 | 27.00 |
| 201/2 | 12.50 | *Bore 3 | 16-men | | |
| 24 | 14.60 | | | Nos 122 | AND 132 |
| $\overline{25}$ | 15.25 | 15 | 10.50 | Nos. 122 and 1 *Bore 3{}-inch | |
| 30 | 20.90 | 17 | 12.10 | | 18 111011 |
| 36 | $\frac{27.50}{27.50}$ | 18 | 12.65 | 1714 | 14.15 |
| | | 19 | 13.50 | 1914 | 15.25 |
| Nos. 75, | 78 AND 88 | 20 | 14.05 | 1934 | 15.75 |
| *Bore 2 | la-inch | 21 | 14.75 | $213\frac{1}{4}$ | 16.80 |
| 10 | 7.50 | 2234 | 16.25 | 2914 | 22.55 |
| 12 | 7.50 | †C24 | 17.20 | 361/2 | 27.65 |
| 14 | 8.00 | 25 | 18.50 | 371/4 | 32.00 |
| 16 | 8.50 | $28^{3}4$ | 21.00 | 31/4 | |
| 20 | 10.25 | †C30 | 23.25 | No. | 124 |
| 24 | $12.50 \\ 15.00$ | 36 | 28.20 | *Eore 3 | ¦}-inch |
| 3014 | 1.).00 | | | 164 | 12.50 |
| Nos. 103 | AND 131 | | 114 | 1834 | 14.75 |
| | ₁ 76-inch | *Bore 3 | 1,4-1HGH | | 17.50 |
| | 10 | 1612 | 10.85 | $\frac{21}{24}$ | 19.75 |
| 14 | 9.00 | $\frac{10^{13}}{18!}$ | $\frac{10.65}{12.50}$ | $27\frac{1}{2}$ | 22.00 |
| 161 ₂ | 9.75 | $\frac{1052}{1915}$ | 13.00 | 31 31 | |
| 10,5 | 9.60 | 1972 | 13.00 | 31 | 26.00 |

^{*}An extra charge is made for wheels having special hubs or wheels bored larger than specified above on account of additional weight.

[†]Wheels marked "C" can be furnished chilled if desired. Special discount for additional charge for splitting. Use Sprocket list for the corresponding diameters,

ROBINS' TROUGHING CARRIERS AND STANDARD RETURN ROLLERS

ROBINS' TROUGHING CARRIERS



Fig. 8584A

The Robins' Patent Troughing Carriers, for simplicity, strength and high efficiency are unexcelled, and since their introduction have been extensively imitated. The method of lubrication by compression grease cups is simple and reliable. Through holes drilled in the shafts the grease works into the bearing. These cups are extra large size and hold sufficient grease for several months supply. In the illustration we show a Robins' Carrier mounted on a board which, is in turn carried on two stringers under which is shown a standard return idler carried in drop hangers. Prices and specifications on application.

STANDARD RETURN ROLLERS



Fig. 8584B

| Width of Belt Inches | Size of Pulley Inches | Number of Pulleys | End to End of Shaft, Inches | Price Each |
|-------------------------|--------------------------|----------------------|--------------------------------|---------------|
| 12 | 6 x 4 | 2 | $\frac{217}{3}$. | 2.35 |
| 14 | 6 x 4 | 2 | 2378 | 2.40 |
| 16 | 6 x 4 | 3 | 257 | 3.40 |
| 18 | 6 x 4 | 3 | 317 | 3.45 |
| 20 | 6 x 4 | 3 | 337 8 | 3.50 |
| 22 | 6 x 4 | 3 | ∃ 357 °s | 3.60 |
| 24 | 6 x 4 | 3 | 39 | 3.70 |
| 26 | 6 x 4 | 3 | 417 | 3,75 |
| 28 | 6 x 4 | 4 | 437 | 4.65 |
| 30 | 6 x 4 | 4 | 457 | 4.70 |
| 32 | 6 x 4 | 4 | 477 | 4.75 |
| 34 | 6 x 4 | 4 | 497 \$ | 4.85 |
| 36 | 6 x 4 | 4 | $517\frac{\circ}{8}$ | 4.90 |
| 40 | 6 x 4 | ō | $\geq -557 \frac{7}{8}$ | 5.80 |
| 42 | 6 x 4 | 5 | 577 % | 5.85 |

STEEL LINK CHAIN CONVEYOR

LOG CONVEYOR, V-SHAPED TROUGH Steel Chain, with Carriers and Spurs HEAVY LOG HAUL-UP Showing Usual Construction of Runway



Fig. 1117A
Especially desirable for long runs.



Fig. 1117B

GROOVED TROUGH
Conveyor drags on the Wooden Flights in Both Directions

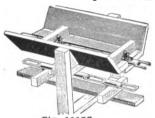


Fig. 1117C

This style has proven very satisfactory for handling sawdust, shavings, refuse, etc

STEEL CABLE CONVEYORS

STYLE V1
For Handling Shavings, Chips, Blocks,
Coal. etc.

STYLE V2
For Handling Logs, Pulp Wood, etc

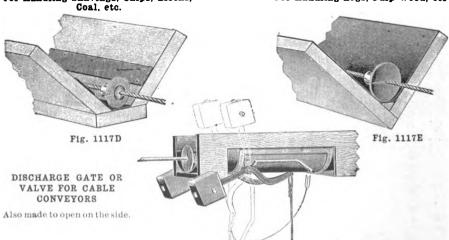


Fig. 1117F

CONTINUOUS BUCKET FLEVATORS AND SAFETY BARREL LOADING DEVICES

CONTINUOUS BUCKET ELEVATOR



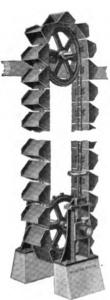




Fig. 521A

Fig. 521B

CONTINUOUS BUCKET ELEVATORS

We illustrate herewith a continuous bucket elevator, mounted on a single strand of chain, and running over a traction wheel at the top, and a sprocket at the bottom. The lower shaft is carried in extra heavy floor type take-ups mounted on concrete piers.

This type of elevator is very often run without casings, as shown, and is used for heavy material and should run at a speed of about 100 feet per minute. The back of each bucket forms a chute for the discharge of the following bucket, and with the discharging chute of the elevator properly located, will give a perfect delivery of the material conveyed. Prices on application.

ANDRUS SAFETY BARREL LOADING DEVICES

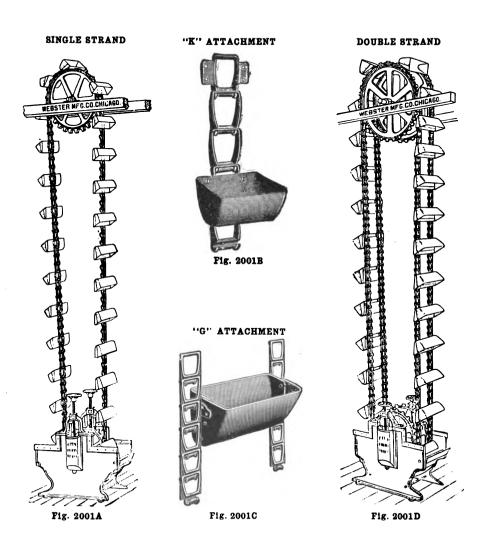
This elevator is made with automatic collapsing arms that close upon contact with any obstruction in the way of lowering bag or barrel. By this outlit the barrel can be automatically handled from floor to floor, received and discharged properly. If from any cause the barrel fails to move from the elevator runway, the arms fold back against the chain, not receiving any more material at the point of delivery and the elevator will run this way without causing any damage to the machine or the material handled, until the man in charge discovers the obstruction.

These elevators are just the thing for oil mills, vinegar works, oil storage houses and sugar refineries where large quantities of barrels, boxes or bags are to be handled.

Prices on application.



CHAIN ELEVATORS



These are chiefly used for the smaller buckets and elevators of moderate height.

CONVEYOR BOXES FOR SPIRAL CONVEYORS STANDARD

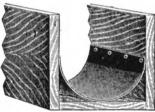


Fig. 1123A

| Diameter of Conveyor inches | 3 | 4 | 6 | 8 | 9 |
|---|-------|------|-------|------|-------|
| Depth Inside Measure of Box | 33/4 | 47/8 | 67/8 | 9 | 10 |
| Width " " "" " | 4 | 43/4 | 7 | 9 | 10 |
| Drop of Hanger " | 2 | 23/8 | 31/2 | 41/2 | 5 |
| Drop of Hanger " Length of Hanger Bearing " | 11/4 | 11/2 | 2 | 2 | 2 |
| Diameter of Conveyorinches | 10 | 12 | 14 | 16 | 18 |
| Depth Inside Measure of Box " | 111/2 | 14 | 161/8 | 18 | 20 |
| Width " " " | 11 | 13 | 15 | 17 | 19 |
| Drop of Hanger | 6 | 73/8 | 85/8 | 91/2 | 101/2 |
| Length of Hanger Bearing " | 2 | 2 | 2 | 3 | 3 |

The best service is obtained by running the Conveyor close to the bottom of trough. About 1/2-inch clearance in 4 and 6-inch Conveyors and a little more in the larger sizes.

STANDARD

CONVEYOR LININGS

PERFORATED



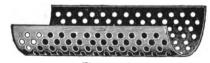


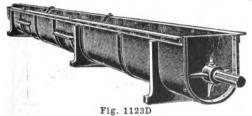
Fig. 1123B

Fig. 1123C

| Diameter of Conveyorinches | 4 | 6 | 8 | 9 | 10 | 12 | 14 | 16 | 18 |
|---|----------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Gauge of Steelnumber Widthof Sheetinches Standard Length of Sheet " Priceper lineal foot | 8½ 30 | 22 11¼ 30 .10 | 20 16 30 .16 | 20 16 30 .16 | 20 18 30 .19 | 20 20 30 .20 | 18 24 30 .34 | 18 27 30 .36 | 18 36 30 .49 |

Prices of perforated linings on application.

CAST IRON AND WROUGHT STEEL TROUGHS



In modern plants cast iron and wrought steel boxes are rapidly superseding those of wood, the many advantages derived from their use more than compensating for the increased first cost. Prices on application.

STANDARD STEEL SPIRAL CONVEYOR



The following illustrate a few of the different styles used in various industries:



CUT FLIGHT CONVEYOR





DOUBLE FLIGHT CONVEYOR



Fig. 1191E

| Diameter of Conveyor Inches | Price Regu- lar Gauge Standard Conveyor per Foot | Price Galvanized per Foot | Speed Revolutions per Minute | Carrying Ca- pacity Bushels per Hour | Standard Conveyor Length Feet | Inside Diam eter Hollow Conveyor Shaft Inches |
|--------------------------------------|--|---------------------------------|------------------------------------|--|--|---|
| 4 | 1.40 | 1.90 | 100 | 100 | 8 | 1 |
| 6 | 2.00 | 2.70 | 140 | 300 | 10 | 11/2 |
| * 8 | 2.50 | 3.50 | 150 | 750 | 10 | 2 |
| 9 | 2.50 | 3.50 | 150 | 1000 | 10 | 11/2 |
| *10 | 3.50 | 5.00 | 160 | 1100 | 10 | 11/2 |
| 12 | 3.50 | 5.00 | 160 | 2000 | 12 | 2 |
| 16 | 5.00 | 7.00 | 160 | 3000 | 12 | 2 |
| 16 | 6.25 | 8.75 | 160 | 5000 | 12 | 3 |
| 18 | 7.50 | 10.50 | 160 | 6000 | 12 | 3 |

The prices include one Hanger and one Coupling with each Standard length, with necessary Bolts and Lining. Standard length given includes the width of one Hanger Bearing. Deductions allowed on parts not furnished. * Not carried in stock.

Prices furnished on application of hangers other than standard.

CONVEYOR COUPLINGS AND FLIGHTS

STANDARD COUPLINGS



Fig. 1120A

| Diam. of Conveyorinches | 4 | 6 | 9 | 12 { | 16—on 2-in. pipe | 16—on 3-in, pipe |
|--------------------------|----------|----------------------------|----------------------------|-----------|---------------------|---------------------|
| " " Coupling " Priceeach | 1 .50 | $\frac{1\frac{1}{2}}{.75}$ | $\frac{1\frac{1}{2}}{.75}$ | 2 1.50 | 1.50 | 3 2.50 |

FLIGHTS AND SUPPORTS
STANDARD FLIGHT SUPPORTS OR FASTENINGS







Fig. 1120C

THICKNESS OF FLIGHTS, INCHES, PRICE EACH



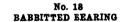
Fig. 1120D

Approx. Outside Diam.

| Conveyor | | | | | | | | Pitch | of Pipe |
|----------|----------|------|------|------|------|------|-------|--------|---|
| Inches | Standard | 1/8 | 3 | 1/4 | 5 | 3/8 | 1/9 | Inches | Inches |
| 3 | .20 | .30 | | | | | | 3 | 11/16 |
| 4 | .20 | .30 | .50 | .75 | | | | 41/2 | 15/16 |
| 5 | .30 | .40 | | | | | | 6 | 17/8 |
| 6 | .30 | .40 | .60 | 1.00 | | 1.50 | | 6 | 17/8 |
| 7 | .45 | .65 | 1.CO | | | | | , 6 | 17/8 |
| 8 | .45 | .65 | 1.00 | 1.50 | | | | 91/2 | 17/8 |
| 9 | .45 | .65 | 1.00 | 1.50 | 2.00 | 2.50 | 3.75 | 91/2 | 17/8 or 23/8 |
| 10 | .75 | 1.00 | 1.50 | 2.20 | 2.75 | 3.25 | 4.50 | 91/2 | 17/8 or 23/8 |
| 12 | .75 | 1.00 | 1.50 | 2.20 | 2.75 | 3.25 | 4.50 | 12 | $2\frac{3}{8}$, $2\frac{7}{8}$ or $3\frac{1}{2}$ |
| 14 | 1.00 | 1.20 | 2.25 | 3.50 | 4.50 | 5.00 | 6.50 | 12 | $2\frac{3}{8}$, $2\frac{7}{8}$ or $3\frac{1}{2}$ |
| 16 | | 1.35 | 2.50 | 4.00 | 5.00 | 5.75 | 7.50 | 12 | $2\frac{3}{8}$, $2\frac{7}{8}$ or $3\frac{1}{2}$ |
| 16 | | 1.35 | 2.50 | 4.00 | 5.00 | 5.75 | 7.50 | 16 | $3\frac{1}{2}$ |
| 18 | | 2.25 | 3.50 | 5.25 | 6.00 | 7.50 | 10.00 | 16 | 31/2 |
| 20 | | | 4.50 | 6.50 | 7.50 | 9.50 | 12.50 | 16 | 31/2 |

| SUPPORTS | | | | | | | | |
|--|------------|-----------------|------------|-----------------------------------|------------|----------|-----------|------------------------|
| No. of Center Lug Pattern | 24 | 28 | 32 | 32A | 40 | 40A | 48 | 48A |
| No. of End Lug Pattern | 3 | 4 | 6 | 8 | 9 | 12 | 16_ | |
| Diam. of Shank Center Lug. in. " End Lug " | 3 8 | 76 12 .05 | 1 <u>5</u> | $\frac{\frac{1}{2}}{\frac{3}{4}}$ | 5/8 3/4 | 58 78 | 34 7/8 | $\frac{\frac{3}{4}}{}$ |
| Price, Center Lugeach End Lug | .04 .08 | .05 .09 | .06 .11 | .07 .16 | .07 | .08 | .10 | .12 |

HANGERS FOR SPIRAL CONVEYORS







SHOWING STYLES AND APPLICATION OF HANGERS TO BOXES

No. 13



Fig. 1124C

No. 14

Fig. 1124D

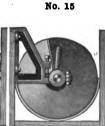


Fig. 1124E

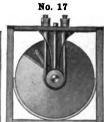


Fig. 1124F

| DIAM., | Inches | Width | | PRICE, EACH | | | | | | | | |
|---------------|---|---------------------------|------------------------|-------------------------|--------|------------|---------|--------|--------|--------|-----------|-----------|
| Con- veyor | Coup- ling | of Bear- ing Inches | No. 13 Solid Eye | No. 13 Bolted Cap | No. 14 | No. 15 | No. 16 | No. 17 | No. 18 | No. 19 | No. 20 | No. 23 |
| 3 | 3/4 | 11/2 | .40 | • • • • | | | | | | | | |
| 4 5 | 1 | 11.2 | .40 | .55 | | | 2.00 | | | | • • • • • | |
| 5 | 1 | 11/2 | .60 | | | | | | | | • • • • | • • • • • |
| 5 | $1\frac{1}{2}$ | 2 | .60 | | | | • • • • | | | | • • • • | |
| 6 | 11_2 | $\frac{2}{2}$ | .60 | .75 | .75 | | 2.50 | .90 | .90 | | • • • • | 1.10 |
| 7 | $egin{array}{c} 1_{12}^1 \\ 1_{12}^1 \end{array}$ | | 1.00 | | | | | | | 2 | | 2112 |
| 8 | 112 | 2 | | 1.00 | 1.00 | | 2.75 | 1.20 | 1.20 | 2.00 | 3.00 | 1.40 |
| 9 | 112 | 2 | | 1.00 | 1.00 | 1.30 | 2.75 | 1.20 | 1.20 | 2.00 | 3.00 | 1.40 |
| 9 | 2 | $\frac{1}{2}$ | | 1.40 | 1.40 | | 3.00 | 1.50 | 1.50 | 2.30 | 3.25 | 1.80 |
| 10 | 11.5 | 2 | | 1.40 | 1.40 | | 3.25 | 1.60 | 1.60 | 2.50 | 4.00 | 2.10 |
| 10 | 2 | 2 | | 1.60 | 1.60 | | 3.50 | 2.00 | 2.00 | 3.00 | 4.25 | 2.40 |
| 12 | 2 | 2 | | 1.80 | 1.80 | 2.00 | 3.50 | 2.00 | 2.00 | 3.00 | 4.25 | 2.40 |
| 12 | 27/6 | 3 | | 2.50 | 2.50 | | 4.50 | 2.75 | 2.75 | 3.75 | 4.75 | 3.00 |
| 12 | 3 | 3 | | 2.70 | 2.70 | | 5.00 | 3.25 | 3.25 | 4.50 | 5.00 | 3.50 |
| 14 | 2 | 2 | | 3.00 | 3.00 | | 5.00 | 3.00 | 3.00 | 4.50 | 5.CO | 3.25 |
| 14 | 27/6 | 3 | | 3.40 | 3.40 | | 5.50 | 3.40 | 3.40 | 5.00 | 5.50 | 3.60 |
| 16 | 2 | 2 | ٠٠٠. | 3.80 | 3.80 | | 5.50 | 3.80 | 3.80 | 5.50 | 5.50 | 4.25 |
| 16 | 3 | 3 | | 4.50 | 4.50 | 5.00 | 6.00 | 4.50 | 4.50 | 6.00 | 6.00 | 5.00 |
| 18 | 3 | 3 | | 5.50 | 5.50 | <u> .</u> | 7.00 | 5.50 | 5.50 | 7.00 | 7.00 | 6.00 |

CAST IRON BOX-ENDS FOR CONVEYORS

FOR WOOD BOX





Fig. 8865A



Fig. 8865B

FOR STEEL BOX

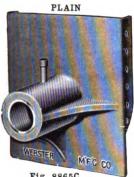


Fig. 8865C



Diameter Diameter PRICE, PLAIN ENDS FOR PRICE, SPLIT ENDS FOR Conveyor of Shaft WOOD AND STEEL BOX, EACH WOOD AND STEEL BOX, EACH Inches Inches Black Galvanized Black Galvanized 2.50 2.00112 6 4.00 5.00 6.253.00 11/2 8 7.00 4.25 5.50 5.50 $1\frac{1}{2}$ 6.25 9 4.50 7.00 9.00 9 2 7.00 7.50 9.75 5.00 11/2 10.25 10 5.50 8.00 8.00 2 6.00 8.50 10 8.50 11.00 $\frac{2}{2}$ $\frac{7}{2^{16}}$ 12 $14.25 \\ 17.75$ 8.00 10.75 11.00 12 12.00 13.75 9.00 12 13.50 14.75 10.00 19.00 $\begin{array}{c} 2\\ 2\frac{7}{16}\\ *3\\ 2\\ 2\frac{7}{16}\\ \end{array}$ 14 10.50 13.75 14.00 18.75 14 11.50 14.75 15.00 20.00 14 12.50 16.0021.00 16.2516 13.00 17.2516.50 22.50 16 13.50 17.75 17.00 23.00 *3 23 50 16 14.00 18.50 17.50 *3 28.75 18 22.00 17.0023.00

*When Webster T-Bolt Coupling is used the bore should be 215 inches instead of 3 inches.

MITER-GEAR BEARING ENDS FOR RIGHT-ANGLE CONVEYORS

Where it is Necessary that Both Conveyors should be on the Same Level
CAST IRON



It is necessary that the proper "hand" of conveyor be used, so that the tendency of a screw conveyor to carry on one side of the shaft will be taken advantage of to assist the end flights of the conveyor in pushing the material past the corner.

We furnish cast iron bearings and boxes as shown above, with miter gears for same.

COUNTERSHAFT BOX END FOR CONVEYOR When Placed at Right Angle to Power-Shaft

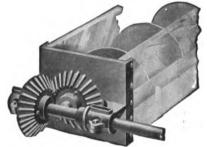


Fig. 1127D

| 01. | | Diame- | C | OUNTERS | HAFT | 21 | | Diam- | C | OUNTER | HAFT |
|------------------------------------|---------------|-------------------------------|-------------------------|---------|---|--------|---------------|--------------------------------|-------------------------|--------|---|
| Size of Con- veyor Inches | Price Each | ter Drive End Inches | Diam- eter Inches | Length | Standard Projection from Bear- ing, Inches | Inches | Price Each | eter Drive End Inches | Diam- eter Inches | Length | Standard Projection from Bear- ing, Inches |
| 4 | 9.00 | 1 | 1 | 16 | 31/2 | 12 | 33.00 | 2 | 2 | 32 | 12 |
| 6 | 12.00 | 112 | 112 | 21 | 6 | 12 | 40.00 | 27/6 | 2 | 32 | 12 |
| 8 | 16.00 | 11/2 | 115 | 24 | 9 | 12 | 45.00 | 3 | 2 | 32 | 12 |
| 9 | 16.00 | 112 | 11/2 | 24 | 9 | 14 | 45.00 | 2 | 2 | 32 | 12 |
| 9 | 22.00 | 2 | 2 | 21 | 9 | 14 | 50.00 | 276 | 2 | 32 | 12 |
| 10 | 24.00 | 11/2 | 112 | 25 | 10 | 16 | 65.00 | 2 | 2 7/6 | 40 | 111/2 |
| 10 | 28.00 | 2 | 2 | 25 | 10 | 16 | 70.00 | 3 | 27/6 | 40 | 1112 |

Above prices include the cast iron box end, necessary drive end projection for the conveyor miter gears and short countershaft projecting far enough to take sprocket wheel or pulley. When required for steel boxes so advise.

We have added to our many convenient appliances for use in connection with these conveyors the device here shown, obviating the use of countershaft with miter gears. Heretofore independent pillow blocks have been used for the countershaft bearings, making expense to provide supports for these bearings. The device here illustrated is a cast iron box end for the conveyor box, and, as a part of the same casting, furnishes the bearings necessary for the miter gear countershaft.

RIGHT-ANGLE CONVEYOR DRIVE

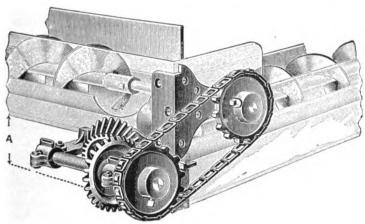


Fig. 1129A

| | | I | Diameter | Standard Pro- | Counti | ERSHAFT |
|----------------------------|------------|----------------------|------------------------------|---|--------------------|------------------------------|
| Size Conveyor Inches | Price Each | Dimension "A" Inches | Both Drive Ends Inches | jection from Conveyor Long Drive End, Inches | Diameter Inches | Standard Length Inches |
| 4 | 16.00 | 31/2 | 1 | 105/8 | 1 | 133/4 |
| 6 | 20.00 | 43/4 | 11/2 | 131/2 | 11/2 | 171/2 |
| 8 | 25.00 | 55/8 | 11/2 | 147/8 | 11/2 | 173/4 |
| 9 | 25.00 | 61/4 | 11/2 | $15\frac{5}{8}$ | 11/2 | 173/4 |
| 9 | 32.00 | 61/4 | 2 | $15\frac{5}{8}$ | 2 | 173/4 |
| 10 | 35.00 | 7 | 11/2 | 181/4 | 11/2 | 201/4 |
| 10 | 41.00 | 7 | 2 | 1814 | 2 | 201/4 |
| 12 | 48.00 | 91/4 | 2 | 201/4 | 2 | 233/4 |
| 12 | 60.00 | 91/4 | 27/6 | 201/4 | 2 | 23¾ |
| 12 | 65.CO | 914 | 3 | 201/4 | 2 | 233/4 |
| 14 | 65.00 | 934 | 2 | 231/2 | 2 | 25¾ |
| 14 | 70.00 | 934 | 27/16 | 231/2 | 2 | 25¾ |
| 16 | 85.00 | 1114 | 2 | 28 | 27/6 | 331/2 |
| 16 | 90.00 | 111/4 | 3 | 28 | 27/6 | 331/2 |

An extra charge will be made when countershafts or drive ends are of special lengths. A device for use with Conveyors running at right angles, where it is desired to deliver the material from one conveyor into the other and apply the power at one point only without any more liability of clogging or choke up than if the material were carried in a straight line.

We furnish casting forming box ends and bearings, as shown; also the miter gears, miter gear shaft, sprocket wheels, chain, set collar, and driving ends of proper length ready

to set up at the angle of the two wooden boxes.

In order to secure proper delivery from one conveyor into the other, it is necessary that the delivering conveyor box should be a few inches higher than the box for the receiving conveyor.

ECCENTRIC BOXES AND STEP BEARINGS

ECCENTRIC BOX



Fig. 1895A

ADJUSTABLE STEP BEARINGS WITH OIL POT



Fig. 1895B

Adjustable horizontally in every direction, with tempered steel button-shaped step accurately fitted.

| Size of Shaft Inches | Price Each | Size of Shaft Inches | Price Each | Size of Shaft Inches | Price Each |
|-----------------------------|-------------------------|---|-------------------------|--|-------------------------|
| $\frac{1_{16}}{2_{16}^{3}}$ | 27.50 28.75 30.00 | $\begin{array}{c} 2\frac{11}{6} \\ 2\frac{15}{6} \\ 3\frac{16}{16} \end{array}$ | 35.00 37.50 42.50 | $ \begin{array}{r} 3_{16}^{7} \\ 3_{16}^{15} \\ 4_{16}^{7} \end{array} $ | 45.00 50.00 60.00 |

ECCENTRIC BOXES

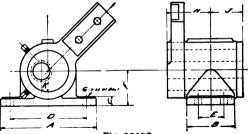


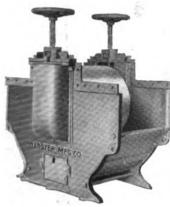
Fig. 1895C

These bearings are used for engaging and disengaging paper friction gearing. They have babbitted bearings and are made only in the rigid pattern. Prices include wrought iron lever.

| Size of Shaft | Price | | | | Di | MENSION | s, Inch | IES | | T-E | 2 |
|------------------|--------|----|--------------------|------|-----------------|---------|-----------------|-------|----------------|----------------|-----|
| Inches | Each | | В | C | D | E | F | G | II | J | K |
| 115 | 42.50 | 11 | $5\frac{1}{2}$ | 1 | 834 | 1 Bolt | 4 | 34 | 4/2 | 35 8 | 34 |
| $2\frac{3}{16}$ | 43.75 | 11 | $5^{1}\frac{7}{2}$ | 1 | 834 | 1 Bolt | 4 | 3/4 | 41/2 | 35/8 | 34 |
| 276 | 45.00 | 11 | 512 | 1 | 834 | 1 Bolt | 4 | 34 | $4\frac{1}{2}$ | 35/8 | 5.8 |
| $2\frac{1}{16}$ | 72.50 | 15 | 8 | 114 | 12 | 4 | 534 | 1 1/8 | 678 | $5\frac{3}{4}$ | 7/8 |
| 218 | 75.00 | 15 | 8 | 114 | 12 | 4 | 5^{3}_{4} | 7/8 | $6\frac{7}{8}$ | $5\frac{3}{4}$ | 1/8 |
| $3\frac{7}{16}$ | 80.00 | 15 | 8 | 11/4 | 12 | 4 | $53\frac{7}{4}$ | 7/8 | 67/8 | $5^{3}4$ | 16 |
| 3₩ | 110.00 | 15 | 8 | 11/4 | 12 | 4 | $_{4}$ | 7/s | 61/8 | 53/4 | 11 |
| 3 § | 120.00 | 19 | 9 | 134 | $15\frac{1}{2}$ | 5 | 7 | 1 | 814 | 69,4 | 1/8 |
| 4 7 | 150.00 | 24 | 11 | 218 | 19 | 7 | 9 | 1 | 93/4 | 73/4 | 1 |
| 4 15 | 160.00 | 24 | 11 | 21 | 19 | 7 | 9 | 1 | 934 | 734 | 1 |

ELEVATOR BOOTS

CAST IRON, STYLE "E"



Pig. 1448A

This style of Boot is made principally of cast iron. The bottom and ends are made of heavy steel. and one end is removable to facilitate cleaning out in case of choke down. The bearings are all of ample size, of the oscillating type, and furnished with an oil tube and cast iron dust shield. The adjusting screws are all steel, with machine-cut square threads and fitted with cast iron hand wheels. The pulley is of cast iron, well proportioned, turned true to diameter, and accurately fitted to boot shaft. These Boots are also furnished with sprocket wheels in place of pulleys, when desired. This style of Boot is strong and substantial, and is recommended for general elevator work.

STEEL, STYLE "F"



Fig 1448B

This Boot is made principally of heavy sheet steel, reinforced by angles, with all parts securely fastened together. It is constructed with side openings and one end removable, to facilitate cleaning out in case of choke down. The bearings are of ample size, babbitted, and adjustable, working in a cast iron frame and adjusted by means of a steel screw with cast iron hand wheel attached. The pulley is of cast iron, turned true to diameter, and accurately fitted to boot shaft. These Boots are also furnished with sprocket wheels in place of pulleys when desired.

This style of Boot is recommended for general work where a less expensive boot is desired than our standard cast iron boot, Style "E."

Prices on application.



PLAIN TAKE-UP BOXES

MADE TO PUSH OR PULL



Fig. 523A



Fig. 523B

The bearings are of the solid type, babbitt lined, and bored to fit the shaft. adjusting screw is of steel, with squared threads securely collared to bearings, and working through a nut of double thickness pocketed in the frame. The hand wheel is of ample size, and is pinned and riveted to screw. If desired, in place of hand wheel the end of screw can be squared for wrench.

LIGHT PATTERN

| | IGHT TAKE-UPS A AND B STYLE | | ! | MEDIUM TAKE-UP A AND B STYLE | 8 |
|-------------------------------|--------------------------------|---------------|-------------------------------|---------------------------------|---------------|
| Length of Travel Inches | Diameter of Shaft Inches | Price Each | Length of Travel Inches | Diameter of Shaft Inches | Price Each |
| 10 | 13/6 | 6.25 | 13 | 17/6 | 8.75 |
| 10 | 17/6 | 6.50 | 13 | 11/6 | 9.00 |
| 10 | 11/2 | 7.00 | 13 | 118 | 9.25 |

HEAVY PATTERN

| A | AND B STYLE | | B STYLE | | | | |
|-------------------------------|--------------------------------|---------------|-------------------------------|--------------------------------|---------------|--|--|
| Length of Travel Inches | Diameter of Shaft Inches | Price Each | Length of Travel Inches | Diameter of Shaft Inches | Price Each | | |
| 17 | 112 | 20.50 | 24 | 1+2 | 24.50 | | |
| 17 | 23/16 | 21.50 | 24 | 28/6 | 25.50 | | |
| 17 | 27/6 | 22.50 | 24 | $2\sqrt{6}$ | 26.00 | | |
| 17 | 211,7 | 23.00 | 24 | 211/16 | 27.00 | | |
| 17 | 215 | 23.75 | 24 | 218 | 28.00 | | |

In ordering state which style is wanted, A or B.

TAKE-UP BOXES AND TAKE-UPS

TAKE-UP BOX Style E



Fig. 3826A

FLOOR TAKE-UPS For Elevator Legs Style F



Pig. 3826B

STYLE E

These take-ups are extra heavy and are used on elevator foot shafts when a feeder or another conveyor is driven from this shaft.

| Size of Bearing Inches | Length of Travel Inches | Price Each |
|---------------------------|----------------------------|---------------|
| 1 { } | 12 | 23.75 |
| 1 į́ž | 18 | 26.00 |
| 2.3 | 12 | 2 5.00 |
| $2\frac{3}{4}$ | 18 | 27 .50 |
| $2 \frac{7}{4}$ | 12 | 26.00 |
| $2\frac{\gamma}{R}$ | 18 | 28.75 |
| 2 <u>ii</u> | 12 | 35.00 |
| 2 1 | 18 | 39.00 |
| 2 } | 12 | 3 6.00 |
| 2 i ž | 18 | 40.00 |
| 3 ¼ | 12 | 39.00 |
| 37 | 18 | 42.50 |
| 313 | 24 | 60.00 |
| 4 7 | 24 | 65.00 |

STYLE F

This take-up is designed to set on the floor at the foot of an elevator. It consists of a heavy cast iron frame with a removable cap in which is inserted a cast nut for the adjusting screw. The bearing is made solid and has a recess to engage the shoulder of the screw and is provided with guides to hold it in position in the frame. These take-ups are used with elevators where the foot shaft is carried independently of the casing of the elevator.

| Size of Fearing Inches | Length of Travel Inches | Price Each |
|---------------------------|----------------------------|---------------|
| 24 | 18 | 30.00 |
| 2 ii | 18 | 31.50 |
| 214 | 18 | 32.50 |
| 3 . | 18 | 33.75 |
| 3% | 18 | 35.00 |



SALEM STEEL ELEVATOR BUCKETS

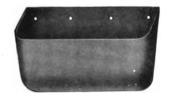


Fig. 1131A

| SIZE I | VCHES | Gauge | Price | Gauge | Price | | | RICE EAG | | |
|----------------|---|--------|-------|--------|-------|------|------|----------|------|-----|
| SIZE I | NUHES | | | Number | | 1 | | GE NUM | BER | |
| Width | Proj. | Number | Each | rumoer | Each | 14 | 12 | 10 | 8 | 6 |
| 2 | 2 | 25 | .10 | 18 | .15 | | | | | |
| 21/2 | 21/4 | 24 | .10 | 18 | .20 | | | | | |
| 3 | 21/4 | 24 | .10 | 18 | .20 | | | | | |
| 31/2 | 212 | 24 | .10 | 18 | .23 | | | | | |
| 3 | 272 | 23 | .10 | 16 | .29 | | | | | |
| 21/ | 21/2 21/2 3 3 | 23 | .10 | 16 | .31 | | | | | |
| 31/2 | 3 | 23 | .15 | 16 | .35 | | | | | |
| 4 | 3 | 23 | .15 | 16 | .39 | | | | | |
| 41/2 | 3 | 22 | .15 | 16 | .36 | .39 | | | | |
| $3\frac{1}{2}$ | $ \begin{array}{r} 3\frac{1}{2} \\ 3\frac{1}{2} \\ 3\frac{1}{2} \end{array} $ | | .15 | 16 | .38 | .41 | | | | |
| 4 | 31/2 | 22 | | | | | | | | |
| 41/2 | $3\frac{1}{2}$ | 22 | .15 | 16 | .40 | .43 | | **** | | |
| 5 | 31/2 | 22 | .19 | 16 | .44 | .47 | | | | |
| 5 | 4 | 22 | .19 | 16 | .48 | .51 | .71 | | | |
| 51/2 | 4 | 21 | .22 | 16 | .49 | .53 | .73 | | | |
| 6 | 4 | 21 | .22 | 16 | .50 | .54 | . 75 | | | |
| 7 | 4 | 21 | .30 | 16 | .53 | .57 | .78 | | | |
| 5 | 41/2 | 20 | .30 | 16 | .51 | . 55 | .76 | .94 | | |
| 6 | 41/2 | 20 | .28 | 16 | .54 | .58 | . 80 | .98 | | |
| 7 | 41/2 | 20 | .30 | 16 | .56 | .60 | .83 | 1.03 | | |
| 8 | 41/2 | 20 | .38 | 16 | .59 | .63 | .87 | 1.08 | | |
| 6 | 5 | 19 | .43 | 16 | .55 | .59 | .82 | 1.01 | 1.19 | 1.3 |
| 61/2 | 5 | 19 | .44 | 16 | .59 | .63 | .87 | 1.08 | 1.27 | 1.4 |
| 7 | 5 | 19 | .45 | 16 | .60 | .65 | .89 | 1.10 | 1.30 | 1.5 |
| 6 | 51/2 | 19 | .46 | 16 | .60 | .65 | .89 | 1.10 | 1.30 | 1.5 |
| 7 | 51/2 | 19 | .49 | 16 | .65 | .70 | .97 | 1.20 | 1.41 | 1.6 |
| 8 | 512 | 19 | .53 | 16 | .68 | .73 | 1.01 | 1.24 | 1.47 | 1.6 |
| | 51/2 | 18 | .68 | 16 | .85 | .92 | 1.27 | 1.56 | 1.85 | 2.1 |
| 9 | 6 | | .55 | 16 | .91 | .98 | 1.36 | 1.67 | 1.98 | 2.5 |
| 10 | - 6 | 18 | .00 | 16 | .98 | 1.05 | 1.45 | 1.79 | 2.12 | 2.4 |
| 11 | 6 | 18 | .63 | | | 1.12 | 1.54 | 1.90 | 2.25 | 2.5 |
| 10 | $6\frac{1}{2}$ | 18 | .85 | 16 | 1.04 | 1.12 | | 2.12 | 2.50 | 2.8 |
| 12 | $6\frac{1}{2}$ | 18 | .95 | 16 | 1.15 | | 1.71 | | | |
| 13 | 61/2 | 18 | 1.00 | 16 | 1.16 | 1.25 | 1.73 | 2.13 | 2.52 | 2.9 |
| 10 | 7 | 18 | .75 | 16 | 1.16 | 1.25 | 1.73 | 2.13 | 2.52 | 2.5 |
| 11 | 7 | 18 | .85 | 16 | 1.23 | 1.32 | 1.83 | 2.25 | 2.66 | 3.0 |
| 12 | 7 | 18 | .90 | 16 | 1.28 | 1.38 | 1.90 | 2.35 | 2.77 | 3.1 |
| 16 | 8 | 18 | 1.40 | 16 | 1.60 | 1.73 | 2.38 | 2.94 | 3.47 | 4.0 |
| 18 | 8 | 18 | 1.50 | 16 | 1.65 | 1.78 | 2.46 | 3,03 | 3.57 | 4.1 |
| 20 | 8 | 18 | 1.70 | 16 | 1.70 | 1.84 | 2.53 | 3.13 | 3.69 | 4.5 |
| 22 | 8 | 18 | 1.95 | 16 | 1.80 | 1.94 | 2,68 | 3.31 | 3.96 | 4.5 |
| 24 | 8 | 18 | 2.15 | 16 | 1.90 | 2.05 | 2.83 | 3.50 | 4.12 | 4.7 |
| 26 | 8 | 18 | 2.50 | 16 | 3.07 | 3.31 | 4.57 | 5.64 | 6.66 | 7.6 |

ACME STEEL ELEVATOR BUCKETS

STYLE A



STYLE B



Fig. 2223A

Pig. 2223B

These well known buckets possess all the elements of lightness and strength. Made in all standard sizes.

GAUGES OF STEEL IN ACME BUCKETS



Fig. 2223C

The above illustration shows the different gauges or thicknesses of steel, actual size, from which the Acme is made. The pages following show the gauges best adapted for the different kinds of work.

METHOD OF CONSTRUCTION

As it Appears when Cut by the Dies from the Sheet



After Being Formed but not Riveted or Pressed

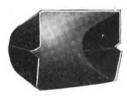


Fig. 2223D

Fig. 2223E

Above is shown the Acme Bucket as it appears when cut by the dies from the sheet; also as it looks after being formed but not riveted or pressed. It will be noted that the lap comes on the end, thus making a brace at the ends, which adds greatly to the strength of the bucket.

ACME ELEVATOR BUCKETS

STYLE A OR B

Revised Price List

| | | • | <u> </u> | | | | | | | | |
|------------------------------------|-----------|-----------|--------------|-----------|-----------|-----------|--|---|-----------|---------------------|--|
| SIZE | | | | , Елсн | | | PRICE, EACH EXTRA HEAVY FOR ELEVATING CEMENT, COAL, ORES, STONE, ETC. | | | | |
| of Bucket Inches | | | GULAR AND EL | | | | | | | | |
| Width Pro- on jection | 23 | 22 | 21 | 20 | 19 | 18 | 16 | 14 | 12 | 10 | |
| 3 x 3 | .09 | | | | | | | | | | |
| 3½ x 3 | .10 | | | | | | •••• | | | | |
| 4 x 3 | 11 | • • • • • | | | | | | | | • • • • | |
| 41/2 x 3 | .12 | | | | | | • • • • | | • • • • • | • • • • | |
| $3\frac{1}{2} \times 3\frac{1}{2}$ | • • • • | .12 | | | | • • • • • | | • • • • • | • • • • | • • • • | |
| 4 x 3 ½ 41/2 x 31/2 | • • • • | .12 | | •••• | | • • • • | • • • • • | | • • • • • | • • • • | |
| | • • • • | | | • • • • • | | • • • • • | • • • • • | •••• | • • • • • | • • • • • | |
| 5 x 4 5½ x 4 | • • • • | .18 | | | • • • • • | • • • • • | • • • • • | | | •••• | |
| 6×4 | • • • • | •••• | .19 | | • • • • • | •••• | • • • • • | | | •••• | |
| 7 x 4 | • • • • • | | .20 | • • • • | • • • • • | • • • • | • • • • | | • • • • • | • • • • | |
| 8 x 4 | • • • • | | .24 | | | •••• | | | •••• | •••• | |
| 9 x 4 | • • • • | | .26 | | | | | | | •••• | |
| 5 x 414 | | | .20 | .26 | | | • • • • | • | | •••• | |
| 6 x 413 | • • • • | | | .28 | | • | •••• | | | •••• | |
| 7 x 413 | •••• | ••• | | .30 | | | •••• | | | •••• | |
| 8 x 41/2 | •••• | | | 32 | | | •••• | | | •••• | |
| $9 \times 41\frac{7}{2}$ | | | | .34 | | | | | | • • • | |
| 6 x 5 . 2 | | | | | .37 | | 1 | | | | |
| 6' 2 x 5 | | | | | .38 | | | | 1 | | |
| 7 x 5 | | | | | .39 | | | | | | |
| 71/2 x 5 | | | | | .40 | | | | | | |
| 8 x 5 | | | | | .41 | | .59 | .66 | .78 | .98 | |
| $8! \le x = 5$ | | | | | .42 | | .61 | .63 | .80 | 1.01 | |
| 9 x 5 | | | | | .43 | | .63 | .70 | .82 | 1.04 | |
| 9 ¹ ⁄ ₂ x 5 | | | | | .44 | | . 65 | .72 | .84 | 1.08 | |
| 10 x 5 | | | | | .45 | | . 67 | .74 | .87 | 1.14 | |
| 11 x 5 | | | | | .46 | | . 69 | .76 | .93 | 1.20 | |
| 12 x 5 | | | | | .50 | | . 73 | .80 | .99 | 1.26 | |
| 6 $x 5! 2$ | | | | | .42 | | .59 | .66 | .81 | 1.05 | |
| $7 \times 5^{1/2}$ | | | | | .44 | | .63 | .70 | .87 | 1.11 | |
| 8×5^{12} | | | | | .46 | | .67 | . 75 | .93 | 1.17 | |
| $9 \times 5\frac{1}{2}$ | | | | | .49 | | .71 | .81 | .99 | 1.24 | |
| 10 $\times 5\frac{1}{2}$ | | | | | .54 | | . 76 | .88 | 1.06 | 1.32 | |
| $11 \times 51\frac{3}{2}$ | • • • • | | | | .57 | | . 79 | .92 | 1.10 | 1.38 | |
| $12 \times 5\frac{7}{2}$ | • • • • | | | | .60 | | .83 | .96 | 1.14 | 1.44 | |
| 9 x 6 | | | | • • • • | | .59 | .77 | .86 | 1.08 | 1.34 | |
| 10 x 6 | • • • • | | | | | .62 | .81 | .90 | 1.14 | 1.41 | |
| 11 x 6 | | | | | | .65 | .85 | .94 | 1.20 | 1.48 | |
| 12 x 6 | • • • • | | | | | .68 | .89 | .98 | 1.26 | 1.55 | |
| 13 x 6 | • • • • | • • • • | • • • • | • • • • | • • • • • | .71 | .93 | 1.02 | 1.32 | 1.62 | |
| 14 x 6 15 x 6 | • • • • | | | • • • • | | .74 | .97 | 1.06 | 1.38 | 1.69 | |
| 15 x 6 16 x 6 | • • • • | | | | | .77 | 1.01 | 1.10 | 1.44 | 1.77 | |
| 18 x 6 | • • • • | | | • • • • | | .81 | 1.05 | $1.15 \\ 1.25$ | 1.50 | 1.85 | |
| 20 x 6 | • • • • | | • • • • | | | .89 | $1.13 \\ 1.21$ | 1.25 | 1.61 | 2.01 | |
| 10 x 613 | • • • • | • • • • • | | ٠ | | .95 | | 1.05 | 1.73 | $\frac{2.17}{1.59}$ | |
| 4.3 | • • • • | | • • • • | | | .69 75 | .90 | 1.03 | 1.27 | 1.74 | |
| 12 x 61 2 | • • • • • | • • • • • | • • • • • | <u> </u> | | . 75 | .98 | 1.10 | 1.37 | 1.11 | |

ACME ELEVATOR BUCKETS

STYLE A OR B

Revised Price List

| Size of | | Price | Each | | Price Each Extra Heavy for Elevating Cement, Coal, Ores, Stone, Etc. | | | | | |
|------------------------------------|-----|----------------------|------|------|---|------|------|------|---|--|
| Bucket, Inches | Reg | ular Gaug Elevato | | and | | | | | | |
| Width Pro- on jec- Belt tion | 22 | 20 | 19 | 18 | 16 | 14 | 12 | 10 | 8 | |
| 13x6½ | | | | .78 | 1.02 | 1.17 | 1.42 | 1.83 | | |
| 14x61/2 | | | | .81 | 1.06 | 1.21 | 1.47 | 1.92 | | |
| 15x61/2 | | | | .85 | 1.10 | 1.25 | 1.53 | 2.01 | | |
| 16x61/2 | | | | .89 | 1.14 | 1.30 | 1.59 | 2.10 | | |
| 18x61/2 | | | | .97 | 1.24 | 1.40 | 1.71 | 2.28 | | |
| 20x6½ | | | | 1.05 | 1.34 | 1.50 | 1.85 | 2.46 | | |
| 10x7 | | | | .73 | 1.01 | 1.10 | 1.36 | 1.72 | | |
| 11x7 | | | | .76 | 1.05 | 1.15 | 1.43 | 1.81 | | |
| 12x7 | | | | .80 | 1.09 | 1.20 | 1.50 | 1.89 | | |
| 13x7 | | | | .84 | 1.13 | 1.25 | 1.57 | 1.97 | | |
| 14x7 | | | | .88 | 1.17 | 1.30 | 1.64 | 2.04 | | |
| 15x7 | | | | .92 | 1.21 | 1.35 | 1.71 | 2.13 | | |
| 16x7 | | | | .96 | 1.25 | 1.40 | 1.78 | 2.22 | | |
| *18x7 | | | | | | 1.10 | 1.10 | | | |
| 20x7 | | | | | | | | | | |
| 22x7 | | | | | | | | | | |
| 24x7 | | | | | | | | | | |
| 16x8 | | | | | | | | | | |
| 20x8 | | | | | | | | | | |

^{*}Sizes 18x7 to 20x8 with extra heavy gauges, prices on application.

Special prices quoted on small size buckets heavier gauges than standard, and on large sizes, heavier gauges than No. 10; also on galvanized, brass or copper buckets. Prices quoted on number wanted and style desired.

PERFORATED ELEVATOR BUCKETS





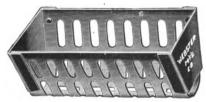


Fig. 4B

For draining material while being elevated we can furnish the "Acme" and other styles of buckets perforated.

Prices on application.

MALLEABLE M. S. IRON BUCKETS

(Manufacturers' Standard)





Fig. 4914A STYLE B



Fig. 4914B

STYLE C

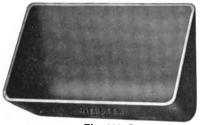


Fig. 4914C



Fig. 4914D

| | } | SIYLE | . A | | | | | |
|--|--|------------------|--|--|------------------|------------------|------------------|----------------------|
| Lengthinches | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12 |
| Width inches Contents cu in Price each | $\begin{bmatrix} 2^3_{4} \\ 16 \\ .21 \end{bmatrix}$ | 3½ 36 .34 | 55 .48 | 4½ 85 .62 | 5 115 .78 | 6 204 1.20 | 6 223 1.30 | 6 246 1.40 |
| Lengthinches | 12 | 14 | 15 | 16 | 14 | 16 | 18 | 18 |
| Width inches Contents cu in Price each | $\begin{bmatrix} 7 \\ 332 \\ 1.85 \end{bmatrix}$ | 7 391 2.10 | $\begin{vmatrix} 7 \\ 425 \\ 2.20 \end{vmatrix}$ | $egin{array}{c} 7 \\ 467 \\ 2.30 \\ \end{array}$ | 8 509 2.75 | 8 593 3.10 | 8 668 3.50 | 10 1053 4 . 75 |

STYLE AA Length inches 10 12 6 8 11 12 14 15 16 Width.....inches 4 5 6 6 6 7 7 7 7 $\begin{array}{c} 246 \\ 1.70 \end{array}$ Contentscu. in. 115 204 223 55 332 391 425 467 1.55.60 1.00 1,45 2.20 2.45 2.60 Price.....each 2.80

| STYLE B | | | | | | | | | | |
|-----------------|------|-----|-----|-----|------|------|--|--|--|--|
| Lengthinches | 4 | 7 | 8 | 10 | 12 | 16 | | | | |
| Widthinches | 11/2 | 313 | 315 | 4 | 51/2 | 61/2 | | | | |
| Contentscu. in. | 6 | 55 | 65 | 107 | 233 | 412 | | | | |
| Priceeach | | .48 | .50 | .90 | 1.44 | 2.30 | | | | |

| STYLE C | | | | | | | | | | | |
|-----------------|------|------|------|------|-----|------------------|------|------|--|--|--|
| Lengthinches | 6 | 7 | 8 | 10 | 12 | 14 | 16 | 18 | | | |
| Widthinches | 41/2 | 41/5 | 41/2 | -5 | 5 | - ₇ - | 7 | -8- | | | |
| Contentscu. in. | | 98 | 112 | 150 | 180 | 437 | 500 | 900 | | | |
| Priceeach | .50 | .55 | .65 | . 75 | .90 | $^{1}2.00$ | 2.20 | 3.25 | | | |

Adapted to the handling of ear corn, cement, coal, chemicals.

EXTRA HEAVY STEEL BUCKETS

SPECIAL SHAPES FOR PHOSPHATE, COAL, STONE, CEMENT, ETC.
8TYLE No. 1
8TYLE No. 2





Fig. 522A

Fig. 522B

STYLES Nos. 1 AND 2

| | BUCKET. | Inches | | WITH B | ELT | Price, Each | | | | | | |
|-----------------|---------------|----------------|--------------------------------|---------------|-----|------------------------|-----|------|------|-----------|------|--|
| Width across | Proj. from | Leugth | OR CHAIN PITCH OF CHAIN INCHES | | | GAUGE OF STEEL, NUMBER | | | | | | |
| Belt | Belt | Belt | | | | 18 | 16 | 14 | 12 | 10 | 8 | |
| 8 | 41/2 | 71_2 | 4 | | | .30 | .35 | .45 | .55 | • • • • • | | |
| 9 | 5 | $\frac{71}{2}$ | 4 | | • • | .35 | .40 | .50 | .70 | | | |
| 10 | 51/2 | 9 | $\frac{43}{4}$ | • : | :: | | .50 | .65 | .95 | 1.20 | | |
| 12 | 6 | $11^{3}4$ | 4 | 6 | 12 | | .80 | .95 | 1.40 | 1.80 | | |
| 14 | 7 | 1134 | 4 | 6 | 12 | | | 1.05 | 1.55 | 1.95 | 2.60 | |
| 16 | 8 | 113/4 | 4 | 6 | 12 | | | 1.20 | 1.85 | 2.25 | 3.00 | |
| 18 | 9 | 113/4 | 4 | 6 | 12 | | | | 2.10 | 2.70 | 3.60 | |
| 18 | 10 | 1734 | 6 | 9 | 18 | | | | | 4.50 | 6.00 | |
| 24 | 12 | 173/4 | 6 | 9 | 18 | | | | | 5.15 | 6.85 | |
| 30 | 12 | 1734 | 6 | 9 | 18 | ١ ١ | | l | | 6.00 | 8.00 | |

STYLE No. 5 CONTINUOUS BUCKETS FOR INCLINED BELT ELEVATORS



Fig. 522C

| Size o | OF BUCKET, I | NCHES | | Pı | кісе, Еасн | | | | |
|----------------|--------------|--------------|------------------------|-----|------------|------|------|--|--|
| Width | Proj. | Length | GAUGE OF STEEL, NUMBER | | | | | | |
| across Belt | from Belt | with Belt | 16 | 14 | 12 | 1' | 8 | | |
| 9 | 6 | 9 | .50 | .60 | .90 | | | | |
| 13 | 7 | 10 | | .90 | 1.35 | 1.70 | | | |
| 16 | 8 | 11 ' | | | 1.75 | 2.20 | | | |
| 18 | 9 | 12 | | | 2.00 | 2.55 | 3.40 | | |
| 24 | 10 | 131/2 | | | · | 3.50 | 4.70 | | |
| 30 | 12 | 15 | | | | 5.15 | 6.85 | | |
| 36 | 13 | 16 | | | | 6.45 | 8.60 | | |

Style Nos. 3, 4, 6 and 7 on application.

CONTINUOUS PAN CONVEYORS

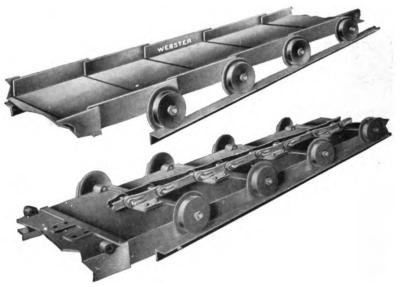


Fig. 1846A

OPEN TOP CARRIER



Fig. 1846B

PIVOTED BUCKET CARRIER



Fig. 1846C

Prices and specifications on application.



TISCO MANGANESE STEEL

Tisco Manganese Steel is a unique metal. It is distinctly an alloy—a combination of a considerable quantity of manganese with steel. As cast it is brittle. Subsequent treatment which is covered by patents, toughens it and enables us to manufacture a thoroughly uniform product. The combined toughness, ductility, malleability and hardness make it remarkable. It is, indeed, the only known metal exhibiting this assemblage of properties, each to so marked a degree. It cannot be machined except by grinding, any tool steels so far known having slight effect upon it. While it is not quite file-hard, it is almost so—but its toughness and strength are such as to account for the splendid results obtained by its use in parts subject to wear of various sorts.

The great reputation made by this metal leads many to believe erroneously that it is a "panacea" or "cure-all" for any trouble that may be experienced with steel castings. There are many admirable steels manufactured, each having a particular use for which it is superior. Our study has been to manufacture and apply the particular steels best adapted to assist heavy wear and breakage.

Only a few years ago mine and mill supplies were bought solely according to prices. Fortunately, this is no longer so, for intelligent users realize that it is costly to dismantle and change parts of machines. The cost of the part replaced may be insignificant as compared with the loss of output during time of changing, while the breakage of a casting may also entail immense loss of output during the time of changing, while the breakage of a casting may also entail immense loss of property and life as well.

It has been our aim to manufacture only the highest grades of steel, and to apply them wherever carefully recorded tests have proved them to be of economic value. Their first cost, as a rule, is higher than that of the parts which they replace. It is our care, therefore, to recommend their use only where they will live long enough to repay the user for the additional initial outlay.

Tisco Steels are known for their uniformity, accurate conformity to pattern, clean appearance and reliability.

Under consideration of the various parts which give trouble, that is, which wear out rapidly, break occasionally, etc., we have brought to bear upon the problem the best, steel talent available either in this country or abroad, with the result that we have supplemented our manufacture of Tisco Manganese Steel with a number of other steels, each of which has proved to be unsurpassed for certain restricted classes of work. Your order, therefore, should read for Tisco Steels, which in every instance will insure your receiving the steel that experience has proved to be best suited to the work which you have in hand.

The final test of superiority is in comparison.

Tisco castings by comparison, conclusively prove their superiority.

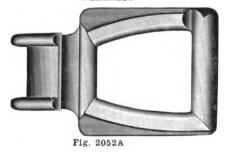
If, for any reason, not the fault of the consumer, Tisco Manganese Steel castings fail to last long enough in comparison with the castings they replace, to pay their difference in cost, the Taylor Iron and Steel Co. will refund a proportionate part of the purchase price so that the cost per ton or per unit of work done shall be no greater than when other castings were used.



TISCO MANGANESE STEEL CHAIN

"WEARLESS"

"GRIT-PROOF"





TISCO "WEARLESS" CHAIN

This chain is interchangeable with all standard link belting and works upon sprocket wheels of the corresponding number. It is unsurpassed in quality and workmanship and will be found far more economical than malleable chains, when working in dust or handling gritty materials.

Attachments can be furnished in any of the standard types, and price will be named upon application where not given.

| Number | Approx. | PRICE. 1 | PER FOOT | Price, per Coup. 2 Links | Number | Approx. | PRICE P | ER FOOT | Price, per |
|--------|---------|----------|--------------------------|-----------------------------|--------|---------|---------|--------------------------|----------------------------|
| Number | Inches | Plain | Att. Links K-1 or K-2 | and 1 Pin | Number | Inches | Plain | Att. Links K-1 or K-2 | Coup. 2 Links and 1 Pin |
| 25 | 4.00 | 1.00 | 1.50 | 1.50 | *114 | 3.25 | 1.25 | 2.00 | 1.50 |
| *88 | 2.60 | . 75 | 1.25 | 1.25 | *124 | 4.CO | 1.50 | 2.75 | 1.75 |
| 93 | 4.05 | 1.25 | 1.50 | 1.50 | *126 | 6.08 | 2.00 | 3.00 | 2.75 |
| *103 | 3.07 | 1.25 | 1.75 | 1.50 | 145 | 7.625 | 2.25 | 3.50 | 5.00 |
| 105 | 6.00 | 1.50 | 2.50 | 2.25 | 150 | 9.00 | 2.25 | 3.50 | 5.25 |
| 108 | 4.70 | 1.25 | 2.25 | 1.50 | ا ا | .: | | 1 | |

Sizes marked (*) are carried in stock and immediate shipment can be made of any quantity.

TISCO "GRIT-PROOF" CHAIN

In an effort to make malleable iron chains suitable for use in handling abrasive and gritty materials various methods of inserting steel bushings have been devised. While bushed chains were a vast improvement over the use of soft iron they have not been altogether satisfactory. The case hardening, at best, affects only the surface of the bushing which, for reasons of design, cannot be very large or substantial. The entire chain must be taken apart for renewal and equipment is necessarily idle when worn bushings are removed and others inserted. Thus the frequency of renewal in stone crushing and cement plants is a considerable factor.

At the urgent solicitation of cement mill engineers we produced the chain listed below without bushings. It is designed to work upon sprocket wheels of our own manufacture only. It will however work upon standard traction wheels for either Ley-Bushed or Peerless Chains. The entire link of Tisco Maganese Steel is tougher and at the same time stronger than any part of a bushed chain.

Tisco Maganese Steel Chains are an unqualified success and in spite of greater first cost show ultimate economy to the user. They have made, and are the sole occupants of a class by themselves in the field of wear and tear.

| | | | | | | | | | - | | |
|--------|-----------------|-----------------|---------------------|------|------|--------|-----------------|-----------------|-----------------------|-------------------------|--------------------------|
| Number | Pitch Inches | Width Inches | Diam of Pin, Ins | | | Number | Pitch Inches | Width Inches | Diam. of Pin, Ins. | Price Plain Links | PER FT. Att. Links |
| 825S | 4 | 4 | 3/4 | | 2.25 | | 6 | 6 | 3/4 | 2.25 | 3.00 |
| 835S | 4 | 6 | 5 8 | 2.00 | 2.50 | 847S | 6 | 712 | 1 | 3.00 | 4.00 |

TISCO MANGANESE STEEL GFARS AND PINIONS







Fig. 1924B

Many times it is impossible to protect heavy service gears from grit and dust about mills that are crushing or handling refractory materials.

The wear consequently is very rapid, which leads unthinking operators to reduce maintenance cost by seeking lower prices—cheaper material is usually cheaper because it is inferior—it all looks the same. Rapid wear continues and breakage ensues making replacements more often necessary.

Taking out worn or broken parts and replacing them, often necessitates dismantling

a machine or line shaft, and almost invariably causes loss of tonnage as well.

Grit has less effect on Tisco Manganese Steel than on any other known metal that can be used for bearings. The remarkable toughness of this metal, coupled with its hardness and strength, accounts for the splendid results which have given Tisco gearing the unquestioned reputation it sustains. Breakage is unheard of. One of our cement mill customers reports three weeks wear for cast iron, two months for steels-Three Years for Tisco Manganese Steel Gears. What can you afford to pay for a metal that will do this? Is first cost worth considering?

Hubs are bored and keyseated as ordered, and gears made either solid or split, with

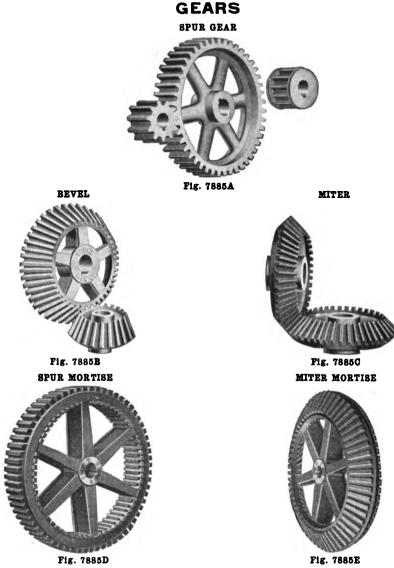
or without clutch hubs.

Tisco Manganese Steel is so much stronger than cast iron that usually it is not

necessary to shroud the teeth of gears made of it, which are to replace cast iron gears.

Orders for gears should state whether spur, bevel or mitre are wanted and should give full information as to the number of teeth, also number of teeth in engaging gear; pitch, whether linear, circular or diametral, length of face, number of teeth; length, bore and position of hub; size of keyway, and its location, if necessary, and whether or not set screws are wanted.

Aside from all considerations of longer life, the saving in lost time and the elimination of annoyances caused by the breakage or rapid wearing out of other parts, more than pays for the cost of the same equipment made of Tisco Manganese Steel.



Gears shown above are accurately machine finished and have been made as comprehensive as possible. The Mortise Gears are filled with thoroughly seasoned, Hard Maple Cogs, accurately dressed so as to assure uniformity and correct pitch of teeth.

In ordering be as explicit as possible, giving the speed of both shafts, power to be transmitted, maximum or minimum diameter, the pattern number, pitch diameter, number of teeth, pitch and face, exact size of bore in inches and whether wanted with keys or set screws. If Spur Gears give the distance between shaft centers.

Prices on application.

MANILA AND SISAL ROPE



Fig. 7365A

APPROXIMATE WEIGHT AND STRENGTH OF CORDAGE

Manila, Sisal and Jute Ropes weigh about alike. Tarred Hemp Cordage will weigh about one-fourth more. Hawser Laid Rope (unlubricated) will weigh one-sixth less. The working strain is one-third of breaking strain. One fathom equals six feet in length.

| Diameter | Circumference | Weight 100 Fathoms | LENGTH IN | One Pound | Government Test Strength New Rope |
|---------------------------------|------------------------|-----------------------|---|---|--------------------------------------|
| Inches | Inches | Pounds | Feet | Inches | Pounds |
| 34 | 3/4 | 12 | 50 | | 450 |
| 5% 3% 3% 7% full | 15% | 17 | 33 | l | 708 |
| 3% | 11/8 | 23 | 25 | l | 1000 |
| % | 15 thread | 31 | 19 | | 1280 |
| ‰ full | 18 " | 45 | 13 | | 1500 |
| 1/2 scant | 21 " | 50 | 12 | | 1580 |
| 1/6 | 11/2 | 52 | 11 | | 1760 |
| 92 | 134 | 70 | | l :::: | 2400 |
| 5% | $\frac{13\sqrt{4}}{2}$ | 83 | 7 | | 3140 |
| 1/2 2/6 3/4 2/8 1/8 | $\bar{2}$ 1/4 | 105 | 9 7 6 5 | | 3970 |
| 1% | $2i\lambda$ | 125 | 5 | | 4900 |
| ús. | 23/4 | 155 | 4 | 1 | 5925 |
| 1′™ | 3 | 175 | 3 | 6 | 7050 |
| 11/4 | 31/4 | 205 | 4 3 2 2 2 2 | 10 | 8275 |
| 1½ 1¾ | 31/6 | 255 | $\bar{2}$ | 4 | 9600 |
| 11/4 | 334 | 280 | $\bar{2}$ | ī | 11020 |
| 18% | 4 | 310 | 1 | 10 | 12540 |
| 13% | 41/ | 355 | ī | 8 | 14150 |
| 112 | 412 | 410 | ī | 5 | 15870 |
| 15% | 43/ | 450 | ī | 4 | 17680 |
| 14% | 5 4 | 500 | ī | $\hat{2}$ | 19590 |
| 18/ | 51/ | 550 | i î | ĩ | 21600 |
| 17% | 514 | 610 | _ | 1134 | 23700 |
| 116 | 5 3/4 | 690 | | 10 | 25910 |
| 17/8 11/16 2 | 6 4 | 750 | | 91/2 | 28210 |
| 28/ | 61/2 | 845 | | 81% | 33110 |
| 218 | 7 7 7 | 1000 | | 81/2 | 38400 |
| $\tilde{2}_{12}^{73}$ | | 1100 | • | 61/3 | 44080 |
| 272 95/ | 7½ 8 | 1270 | •••• | 51% | 50150 |
| 378 | 9 | 1595 | •••• | 412 | 63480 |
| 31/ | 10 | 1940 | •••• | 334 | 78370 |
| 25/8 3 31/3 32/3 4 | 11 | 2285 | | 374 | 94830 |
| 473 | 12 | 2690 | • | $\begin{vmatrix} 3 \\ 21/2 \end{vmatrix}$ | 01000 |
| 4 | 12 | 2090 | | $1 2 \sqrt{2}$ | |

Manila Rope is about 40 per cent stronger than Sisal Rope. Full coils measure about 1200 feet in length. We also keep half coils measuring 600 feet.

MANILA AND SISAL ROPE

REGULAR LAID MANILA AND SISAL ROPE

| Diameterinches | 1/2 and Larger | 3/8 | 5% and 1/4 | 3/6 |
|----------------|----------------|--------------|-------------|--------------|
| Priceper pound | Base | .005 advance | .01 advance | .015 advance |

LARIAT ROPE, HARD LAID UNOILED

| Diameter inches | 3/8 | 7/16 | 1/2 |
|------------------------|--------------------|-------------|-------------|
| Three-Strand per pound | .02 advance | .02 advance | .02 advance |
| Four-Strand " | $.02\frac{1}{2}$ " | .021/2 " | .021/2 " |

MANILA BULL ROPE

| 1 | | | |
|-------|-----|-------|------|
| Price | per | pound | Base |

MANILA DRILLING CABLE

Price.....per pound Special

SISAL LATH YARN

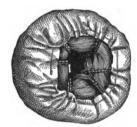




Fig. 3408A

UNTARRED AND TARRED

| | | Fig. | 3408 |
|--|--|------|------|
| | | | |

| Coarse | 101 | Strings | to | the | Strand | lper pound | |
|--------|-----|---------|----|-----|--------|------------|-----------|
| Medium | | " | " | " | " | | |
| Fine | 200 | 66 | " | " | ** | | • • • • • |

Put up in coils of 100 pounds each.

BRAIDED COTTON SASH CORD



| Fig. 3 | 34(|)8(| С |
|--------|-----|-----|---|
|--------|-----|-----|---|

| Number | 6 | 7 | 8 | 9 | 10 | 12 |
|-----------------------------------|---|---|----------|------------------------|---------|-----------|
| Diameter inches Feet to the pound | 1 | $\begin{array}{c} \frac{7}{32} \\ 52 \end{array}$ | 14 44 | 3 ⁹ 2 36 | % 27 | 3/8 20 |

Put up in Hanks of 100 feet each.



SPECIAL TALLOW-LAID MANILA ROPE

For Power Transmission

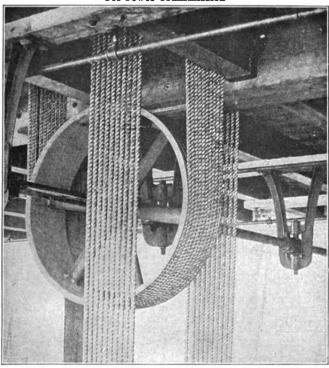


Fig. 1096A

This is a specialty of our cordage company, who have for years made a careful study of the subject. After many experiments they have produced in this rope one that is absolutely unequaled for the purpose, not only as regards strength, but durability as well. Every thread of the rope is carefully selected from the longest and choicest Manila fibre, and is laid up in an expensive lubricant particularly adapted for the purpose. It is absolutely the best rope for transmitting power ever put upon the market, and always gives perfect satisfaction. We carry in stock the following sizes, all four-strand:

APPROXIMATE WEIGHT AND STRENGTH OF MANILA TRANSMISSION ROPE

| Diameter | Circumference Inches | Weight of 100 Feet in Pounds | Length of Rope is 1 Pound | | |
|-------------|-------------------------|---------------------------------|------------------------------|---------|-------|
| 1/2 | 11/2 | 11 | 2250 | 9 ft. 2 | in. |
| 5,8 | 2 | 15 | 4000 | 6 " 8 | 44 |
| 34 | 214 | 20 | 5000 | 5" | |
| $\bar{\nu}$ | 234 | 25 | 7500 | 4 " | |
| 1 0 | 3 | 33 | 9000 | 3 " | |
| 11/8 | 31/2 | 41 | 12250 | 2 " 6 | 44 |
| 11/4 | 334 | 50 | 14000 | 2 " | |
| 13% | 414 | 62 | 18062 | 1 " 8 | " |
| 11% | 41/2 | 75 | 20250 | 1 " 3 | 44 |
| 153 | 5 | 95 | 25000 | 1 " 1 | " |
| 134 | 51/2 | 115 | 30250 | 10 | 1/5 " |
| 2 * | 6 | 142 | 36000 | 9 | 1/2 " |

ROPE POWER TRANSMISSION

TABLE HORSE-POWER TRANSMITTED BY MANILA ROPE

| Velocity of Rope in | | Diameter of Rope | | | | | | | | | | |
|---------------------|--------|------------------|--------|---------|---------|---------|--------|--|--|--|--|--|
| Feet, per Minute | ½ Inch | ¾ Inch | 1 Inch | 1¼ Inch | 1½ Inch | 1¾ Inch | 2 Inch | | | | | |
| 1000 | 1.24 | 2.25 | 3.57 | 5.59 | 8.02 | 10.85 | 14.20 | | | | | |
| 2000 | 2.70 | 3.84 | 6.84 | 10.68 | 15.39 | 20.93 | 27.36 | | | | | |
| 2500 | 3.30 | 4.71 | 8.38 | 13.10 | 18.86 | 25.66 | 33.54 | | | | | |
| 3000 | 3.83 | 5.46 | 9.80 | 15.39 | 21.87 | 29.74 | 38.88 | | | | | |
| 3500 | 4.30 | 6.23 | 11.09 | 17.33 | 24.94 | 34.03 | 44.35 | | | | | |
| 1000 | 4.74 | 6.83 | 12.15 | 18.98 | 27.33 | 37.17 | 48.59 | | | | | |
| 1500 | 5.01 | 7.24 | 12.89 | 20.15 | 29.00 | 39.45 | 51.57 | | | | | |
| 5000 | 5.20 | 7.47 | 13.29 | 29.76 | 29.89 | 40.65 | 53.15 | | | | | |
| 5500 | 5.29 | 7.60 | 13.53 | 21.14 | 30.43 | 41.39 | 54.11 | | | | | |
| 3000 | 5.08 | 7.32 | 13.10 | 20.36 | 29.32 | 39.77 | 52.12 | | | | | |
| 3500 | 4.74 | 6.83 | 12.13 | 19.00 | 27.34 | 37.21 | 48.63 | | | | | |
| 7000 | 4.12 | 5.93 | 10.54 | • 16.47 | 23.72 | 32.26 | 42.18 | | | | | |
| 7500 | 3.25 | 4.67 | 8.32 | 13.00 | 18.73 | 25.42 | 33.23 | | | | | |

TABLE OF WEIGHTS, STRENGTH, PULLEY DIAMETERS TO BE USED IN CONNECTION WITH MANILA ROPE

| Size of Ropeinches | 3/8 | 1/2 | 5/8 | 34 | 7/8 | 1 |
|---|-------|-------|-------|-------|-------|-------|
| Approximate Weight of 1000 ftlbs. Breaking Strain of New Rope "Proper Diameter Pullevinches | 75 | 95 | 160 | 200 | 280 | 350 |
| | 1280 | 2250 | 4000 | 5000 | 7500 | 9000 |
| | 18 | 22 | 24 | 30 | 36 | 42 |
| Size of Ropeinches | 11/8 | 1!4 | 13/8 | 11/2 | 13/4 | 2 |
| Approximate Weight of 1000 ft lbs. | 420 | 500 | 650 | 700 | 1120 | 1300 |
| Breaking Strain of New Rope " | 12250 | 16000 | 18000 | 22500 | 30250 | 39000 |
| Proper Diameter Pulley inches | 48 | 54 | 57 | 60 | 72 | 84 |

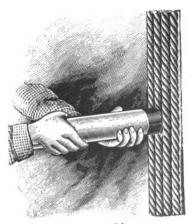


Fig. 1097A

TRANSMISSION ROPE DRESSING

For preserving Manila Transmission Rope. Keeps it soft and pliable. Protects it from internal and external friction, heat, and moisture. Especially desirable for out-door rope drives or those running in rooms filled with steam or dry heat. Price per bar,

DODGE IRON ROPE SHEAVES

FOR % AND 1-INCH ROPES

| Diameter | | Price, Each Number of Grooves | | | | | | | | | | |
|--------------------------|----------------|----------------------------------|--------------------|--------|-----------------|------------------|------------------|------------------|--------------------|------------------|--|--|
| Inches | | | | | | | | | | 10 | | |
| - | 1 | 2 | 3 | 4 | 5 | 6 | <u> </u> | 8 | 9 | 10 | | |
| 24 | 14.60 | 19.70 | | 30.00 | 35.40 | 40.80 | 46.60 | 52.30 | 58.30 | 64.60 | | |
| 26 | 15.80 | 21.10 | | 32.30 | 37.90 | 43.80 | 49.90 | 55.20 | 62.60 | 69.20 | | |
| 28 | 17.00 | 22.70 | | 34.60 | 40.70 | 46.90 | 53.40 | 60.10 | 66.00 | 74.00 | | |
| 30 | 18.40 | | | 37.00 | 43.60 | 50.30 | 57.10 | 64.10 | 71.30 | 78.70 | | |
| 32 | 19.70 | 26.20 | | 39.60 | 46.70 | 53.80 | 61.20 | 68.80 | 76.60 | 84.70 | | |
| 34 | 21.10 | 28.10 | | 42.40 | 49.80 | 57.50 | 65.30 | 73.40 | 80.70 | 90.40 | | |
| 36 | 22.70 | 29.90 | | 45.00 | 52.80 | 60.80 | 69.10 | 77.60 | 86.50 | 95.50 | | |
| 38 | 24.20 | 31.90 | | 47.90 | 56.20 | 64.70 | 73.40 | 82.60 | 90.60 | 100.10 | | |
| 40 | 25.90 | 34.10 | | 51.10 | 59.90 | 68.90 | 78.20 | 87.80 | 97.70 | 107.80 | | |
| 42 | 27.60 | 36.20 | | 54.20 | 63.60 | 73.10 | 82.90 | 93.10 | 103.40 | 114.20 | | |
| 44 | 29.50 | | | 57.80 | 67.80 | 77.90 | 88.30 | 99.10 | 110.20 | 121.60 | | |
| 46 | 31.40 | 41.20 | | 61.20 | 71.60 | 82.30 | 93.20 | 104.50 | 116.20 | 128.00 | | |
| 48 | 33.60 | 43.80 | | 64.80 | 75.70 | 87.00 | 98.50 | 110.40 | 122.40 | 135.00 | | |
| 50 | 35.80 | 46.40 | | 68.60 | | 91.90 | 104.00 | 116.50 | 129.40 | 142.40 | | |
| 52 | 38.20 | 49.60 | | 72.80 | 85.00 | 97.30 | 110.00 | 123.10 | 136.40 | 150.20 | | |
| 54 50 | 40.90 | 52.80 | | 77.30 | 90.00 | 103.10 | 116.40 | 130.20 | 144.20 | 158.80 | | |
| 56 58 | 43.80 | 56.30 | | 82.10 | 95.40 | 109.10 | 123.10 | 137.50 | 152.50 | 167.40 | | |
| 60 | 46.80 | 59.90 | | 86.90 | | 115.20 | 129.80 | 145.00 | 160.40 | 176.30 | | |
| | 50.20 | 63.80 | | | | 121.90 | 137.30 | 153.10 | 169.30 | 186.00 | | |
| 62 | 53.40 | 67.80 | | 97.40 | | 128.60 | 144.70 | 161.30 | 178.20 | 195.60 | | |
| 64 ec | 56.90 | 71.90 | | 103.00 | | 135.50 | 152.30 | 169.60 | 187.00 | 205.40 | | |
| 6 6 | 60.50 | 76.30 | | 109.00 | | 143.20 | 160.80 | 178.90 | 197.50 | 216.50 | | |
| 6 8 7 0 | 64.40 | | | 115.10 | | 150.80 | 169.20 | 188.30 | 207.60 | 227.40 | | |
| 70 72 | 68.60 | | 103.70 | | | 159.00 | 178.30 | 198.10 | 218.40 | 239.00 | | |
| 74 | 73.10 77.90 | | $109.80 \\ 116.20$ | | | 167.80 176.90 | 186.80 198.00 | 208.70 219.60 | $229.80 \\ 241.70$ | 251.50 | | |
| 76 | | | 122.90 | | | | 208.20 | 230.60 | | 264.20 | | |
| 78 | | | 130.10 | | | 186.10 196.20 | 219.10 | 242.60 | 253.70 266.60 | 277.20 291.10 | | |
| 80 | | | 137.60 | | 183.10 | 206.60 | 230.60 | 255.20 | 280.20 | 305.80 | | |
| 82 | 99.00 | 199 40 | 145.40 | 160.00 | 193.10 | 217.60 | 242.50 | 268.10 | 294.10 | | | |
| 84 | 106.00 | 190 60 | 153.60 | 179 90 | 203.30 | 228.70 | 254.80 | 281.40 | 308.40 | 320.80 336.10 | | |
| 86 | 119 70 | 127 30 | 162.40 | 197 00 | 203.30 214.00 | 240.60 | 267.70 | 295.30 | 323.60 | 352.30 | | |
| 88 | | | 171.60 | | 225.40 | 253.10 | 281.40 | 310.20 | 339.60 | 369.50 | | |
| 90 | | | 181.10 | | | 265.90 | 295.30 | 325.30 | 355.90 | 387.00 | | |
| 92 | | | 191.20 | | | 279.60 | 310.20 | 341.40 | 373.10 | 405.50 | | |
| 94 | 142 90 | 172 00 | 201.60 | 231 60 | 262.30 | 293.50 | 325.30 | 357.70 | 390.70 | 424.30 | | |
| 96 | | | 212.40 | | | 307.90 | 340.80 | 374.40 | 408.70 | 443.50 | | |
| 98 | | | 223.80 | | | 323.00 | 357.20 | 392.10 | 427.70 | 463.80 | | |
| 100 | 170 00 | 203 00 | 237.00 | 271 00 | 305.00 | 340.00 | 375.00 | 411.00 | 448.00 | 486.00 | | |
| 102 | | | 247.00 | | | 354.00 | 390.00 | 426.00 | 464.00 | 503.00 | | |
| 104 | | | 257.00 | | | 368.00 | 405.00 | 442.00 | 480.00 | 521.00 | | |
| 106 | | | 268.00 | | | 382.00 | 420.00 | 458.00 | 496.00 | 539.00 | | |
| 108 | | | 279.00 | | | 396.00 | 435.00 | 474.00 | 513.00 | 557.00 | | |
| 110 | | | 291.00 | | | 410.00 | 450.00 | 490.00 | 530.00 | 575.00 | | |
| 112 | | | 307.00 | | | 429.00 | 471.00 | 513.00 | 555.00 | 602.00 | | |
| 114 | | | 324.00 | | | 448.00 | 492.00 | 536.00 | 580.00 | 629.00 | | |
| 116 | | | 341.00 | | | 467.00 | 513.00 | 559.00 | 605.00 | 656.00 | | |
| 118 | | | 358.00 | | | 486.00 | 534.00 | 582,00 | 630.00 | 683.00 | | |
| 120 | | | 375.00 | | | 505.00 | 555.00 | 605.00 | 655.00 | 710.00 | | |
| 122 | | | 393.00 | | | 524.00 | 576.00 | 628.00 | 680.00 | 737.00 | | |
| | | | | | 497.00 | 543.00 | 597.00 | 651.00 | 706.00 | 764.00 | | |

This list is for solid sheaves only: add 10 per cent to list for split sheaves. Additions and deductions for other sizes of rope will be furnished on application. For loose sheaves add same extra to list price as for loose iron pulleys.



CHAIN



Fig. 1404A

| Size | - Average Weight of Common Straight | | Pro | oof Test, Pot | INDS | |
|--|---|------------|-------|---------------|--------|-------------------------|
| | Link Coil Chain per 100 Feet Pounds | Proof Coil | В. В. | в. в. в. | Dredge | Special Stee Logging |
| 3/6 | 50 | 700 | 800 | 950 | 1150 | 4200 |
| 1/4 | 75 | 1200 | 1400 | 1600 | 1750 | 6000 |
| 5/6 | 110 | 2500 | 3000 | 3350 | 3500 | 9600 |
| 3/2 | 155 | 3500 | 4000 | 4500 | 4800 | 13500 |
| 7/0 | 200 | 4800 | 5500 | 6300 | 6700 | 15800 |
| 1/2 | 265 | 6200 | 7000 | 8000 | 9000 | |
| 9/6 | 325 | 7800 | 8800 | 10000 | 11500 | 1 |
| 5/0 | 420 | 9600 | 10750 | 12500 | 15300 | |
| 11/16 | 500 | 11500 | 12800 | 14750 | 16150 | |
| 3/4 | 590 | 13800 | 15500 | 17750 | 18500 | |
| 13/6 | 700 | 16200 | 18000 | 21000 | 22000 | |
| 3/16/4/16/8/16/8/16/3/8/16/8/16/8/16/8/16/8/16 | 800 | 18800 | 21000 | 24000 | 25000 | |
| 15/16 | 900 | 21500 | 23750 | 27500 | 30000 | |
| 1 | 1000 | 24600 | 27300 | 31350 | 32850 | |
| 11/16 | 1100 | 26300 | 30000 | 33500 | 36000 | |
| 11/8 | 1300 | 29500 | 32500 | 37500 | 39500 | 1 11111 |
| 1 3/6 | 1400 | 33000 | 36500 | 42000 | 44000 | |
| 11/4 | 1500 | 36500 | 43000 | 46350 | 48500 | |
| 15/16 | 1750 | 40000 | 45000 | 51000 | 53000 | |
| 13% | 1900 | 44000 | 49000 | 55000 | 57750 | 11000 |
| $\frac{13_{8}}{17_{16}}$ | 2000 | 48200 | 52500 | 61000 | 64000 | 1 |
| 11/0 | 2100 | 52500 | 58000 | 66550 | 69500 | |
| $\frac{1\frac{1}{2}}{1\frac{9}{16}}$ | 2400 | 57000 | 63000 | 72500 | 76750 | |
| 15% | 2670 | 61700 | 69000 | 79000 | 82500 | |
| 1116 | 2850 | 66500 | 73500 | 84500 | 89250 | |
| 134 | 3100 | 71600 | 79000 | 91000 | 96500 | |

A safe working load is about one-half the proof test; the breaking strain, about double the proof test.

TWIST COIL CHAIN



Fig. 1404B

Twist Coil Chain furnished in all sizes, up to and including 5%-inch.

CONVEYOR OR SPROCKET WHEEL CHAIN



Fig. 1404C

Furnished to order, only. The wheel casting should be sent us, so that we may fit the chain to the wheel. We do not guarantee to fit a sprocket wheel, unless the casting is furnished.

CHAINS

CAR BRAKE CHAIN



Fig. 1405A

Any style R. R. Chain furnished to order.

RAILROAD SWITCH OR WRECKING CHAINS
GRAB HOOK ON ONE END. LONG LINK ON THE OTHER END



Fig. 1405B

GRAP HOOK ON ONE END. AND TWO LONG LINKS IN CHAIN

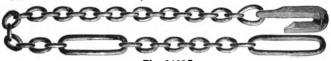


Fig. 1405C

GRAB HOOK ON ONE END, AND SPECIAL SHAPE LONG LINK ON THE OTHER END

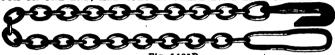


Fig. 1405D

Size (made any desired length).....inches $\begin{bmatrix} 5/8 \\ \end{bmatrix}$ $\frac{3/4}{4}$ $\begin{bmatrix} 7/8 \\ \end{bmatrix}$ 1

ROLLING CHAIN

Fig. 1400E

Size, Polished (made any desired length).....inches 1/4 1/3/6 3/8

LOG CHAIN



Fig. 1405P

Size, Polished (Length, 12 to 14 feet.).. inches $\frac{1}{4}$ $\frac{5}{16}$ $\frac{3}{8}$ $\frac{7}{16}$ $\frac{1}{8}$



Usual Sizesinches $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ $\frac{1}{1}$ $\frac{11}{8}$ $\frac{11}{4}$

STANDARD HOISTING ROPE





Fig. 1408A

SIX STRANDS OF NINETEEN WIRES EACH AND A HEMP CENTER SWEDISH IRON

| Number | Diameter Inches | Price per Foot | Approximate Circumfer- ence Inches | Weight per Foot Pounds | Approximate Breaking Strain, Tons 2000 Lbs. | Working | Minimum Size of Drum or Sheave Feet |
|--------|----------------------------|-------------------|---|------------------------------|--|---------|--|
| 00 | 23/4 | 1.70 | 85/8 | 11.95 | 111 | 22.2 | 17 |
| 0 | 21/2 | 1.40 | 77/8 | 9.85 | 92 | 18.4 | 15 |
| 1 | 21/4 | 1.17 | 71/8 | 8 | 72 | 14.4 | 14 |
| 2 | 2 | .95 | 61/4 | 6.3 | 55 | 11 | 12 |
| 3 | 13/4 | .80 | 51/2 | 4.85 | 44 | 8.8 | 11 |
| 4 | 15% | .65 | 5 | 4.15 | 38 | 7.5 | 10 |
| 5 | 11/2 | .57 | 43/4 | 3.55 | 33 | 6.5 | 9 |
| 51/2 | 13/8 | .49 | 414 | 3 | 28 | 5.5 | 81/2 |
| 6 | 11/4 | .40 | 4 | 2.45 | 22.8 | 4.56 | 71/2 |
| 7 | 11/8 | .33 | 31/2 | 2 | 18.6 | 3.72 | 7 |
| 8 | 1 | .26 | 3 | 1.58 | 14.5 | 2.90 | 6 |
| 9 | 7/8 | .20 | 23/4 | 1.2 | 11.8 | 2.36 | 51/2 |
| 10 | 3/4 | .16 | 21/4 | .89 | 8.5 | 1.70 | 41/2 |
| 101/4 | 5/8 | .12 | 2 | .62 | 6 | 1.20 | 4 |
| 101/2 | 9/16 | .10 | 13/4 | .5 | 4.7 | .94 | 31/2 |
| 103/4 | 1/ | .081/2 | - 11/2 | .39 | 3.9 | .78 | 3. |
| 10a | 7/16 | .071/2 | 11/4 | .3 | 2.9 | .58 | 23/4 |
| 10b | 7/2 7/16 3/8 5/16 | .07 | 11/8 | .22 | 2.4 | .48 | 21/4 |
| 10c | 5/16 | .0634 | 1 | .15 | 1.5 | .30 | 2 |
| 10d | 1/4 | .061/2 | 3/4 | .1 | 1.1 | .22 | 11/2 |

Siemens-Martin Steel Ropes same List as Iron Ropes.

CHICIPLE CAST STEEL

| | | | KUCIBLE | CASIS | IEEL | | |
|---------------|-------------------------|------------|---------------------|------------------------|------|----------------|--|
| 00 | 234 | 2.10 | 85/8 | 11.95 | 211 | 42.2 | 11 |
| . 0 | $2\frac{1}{2}$ | 1.75 | 7/3 | 9.85 | 170 | 34 | 10 |
| 1 | 214 | 1.44 | 718 | 8 | 133 | 26.6 | 9 |
| 2 | 2 | 1.16 | 614 | 6.3 | 106 | 21.2 | 8 |
| $\frac{2}{3}$ | 134 | .90 | $\frac{61/4}{51/2}$ | 4.85 | 85 | 17 | 7 |
| 4 | 15/8 | . 76 | 5 | 4.15 | 72 | 14.4 | 61/2 |
| 5 | 11.6 | .66 | 434 | 3.55 | 64 | 12.8 | 6 - |
| 5 5½ | 13 % | .56 | 41/4 | 3 | 56 | 11.6 | 6 51/ ₂ 5 41/ ₂ |
| 6 7 | $\frac{114}{118}$ | .46 | 4 | 2.45 | 47 | 9.4 | 5 - |
| 7 | 118 | .38 | 31/2 | 2 | 38 | 7.6 | 41/2 |
| 8 | 1 | .31 | 3 | 1.58 | 30 | 6 | 4 |
| 8 9 10 | 78 | .24 | $2\frac{3}{4}$ | 1.2 | 23 | 4.♂ | 4 3½ 3 2½ 2½ 2¼ |
| 10 | 34 | .19 | 2_{-4} | .89 | 17.5 | 3.5 | 3 |
| 1014 | | .14 | 2 | .62 • | 12.5 | 2.5 | 21/2 |
| 101/2 | 916 | .14 .12 | 134 | .5 | 10 | $oldsymbol{2}$ | 214 |
| 1034 | 5 8 9 8 16 1/2 | .11 | 11/2 | .39 | 8.4 | 1.68 | |
| 10a | 76 | .10 | $1^{1}\overline{4}$ | .3 | 6.5 | 1.30 | 13/4 |
| 10b | 3 8 | .031/2 | 118 | .5 .39 .3 .22 | 4.8 | .93 | $1\frac{1}{2}$ |
| 10c | 516 | .0914 | 1 | .15 | 3.1 | .62 | 11/4 |
| 10d | 3 8 5 / 16 1 / | .09 | 34 | .1 | 2.2 | .44 | 1 |

For galvanized or rope with wire center, add 10 per cent.

STANDARD HOISTING ROPE





Fig. 2063A

SIX STRANDS OF NINETEEN WIRES EACH AND A HEMP CENTER EXTRA STRONG CAST STEEL

| Number | Diameter Inches | Price per Foot | Approximate Circumfer- ence Inches | Weight per Foot Pounds | Approximate Breaking Strain, Tons 2000 Lbs. | Working | Minimium Size of Drum or Sheave Feet |
|--------|--------------------|-------------------|---|------------------------------|--|---------|---|
| 00 | 23/4 | 2.55 | 85/8 | 11.95 | 243 | 48.6 | 11 |
| 0 | 21/2 | 2.10 | 77% | 9.85 | 200 | 40 | 10 |
| 1 | 21/4 | 1.70 | 71% | 8 | 160 | 32 | 9 |
| 2 | 2 | 1.34 | 61/4 | 6.3 | 123 | 24.6 | 8 |
| 3 | 13/4 | 1.10 * | 51/2 | 4.85 | 99 | 19.8 | 7 |
| 4 | 15% | .94 | 5 | 4.15 | 83 | 16.6 | 61/2 |
| 5 | 11/2 | .80 | 43/4 | 3.55 | 73 | 14.6 | 6 |
| 51/2 | 13% | .68 | 414 | 3 | 64 | 13 | 51/2 |
| 6 | 11/4 | .56 | 4 | 2.45 | 53 | 10.6 | 5 |
| 7 | 11/8 | .46 | 31/2 | 2 | 43 | 8.6 | 41/2 |
| 8 | 1 | .37 | 3 | 1.58 | 34 | 6.80 | 4 |
| 9 | 7/6 | .29 | 23/4 | 1.20 | 26 | 5.20 | 31/2 |
| 10 | 3/4 | .22 | 21/4 | .89 | 20.2 | 4.04 | 3 |
| 101/4 | 5/2 | . 161/2 | 2 4 | .62 | . 14 | 2.80 | 21/2 |
| 101/2 | 5/8 16 | .14 | 13/4 | .50 | 11.2 | 2.24 | 21/4 |
| 1034 | 1/2 | .121/2 | 11/2 | .39 | 9.2 | 1.84 | 2 |
| 10a | 7 16 | .111/2 | 11/4 | .30 | 7.25 | 1.45 | 13/4 |
| 10b | 3/8 | .11 | 11% | .22 | 5.30 | 1.06 | 11/2 |
| 10c | . 5 | .103/4 | 1 1 8 | .15 | 3.50 | .70 | 11/4 |
| 10d | 16 | .1016 | 3/4 | .10 | 2.43 | .49 | 1 |

PLOUGH STEEL

| 23/4 | 3.00 | 85/8 | 11.95 | 275 | 55 | 11 |
|------|---|--|---|---|---|---|
| 21/2 | 2.50 | 77% | 9.85 | 229 | 46 | 10 . |
| 21/4 | | 71/8 | 8 | 186 | 37 | 9 |
| 2 | | 61/4 | 6.3 | 140 | 28 | 8 |
| 13/4 | | 516 | | | 22 | 7 |
| 15% | | 5 | | | 19 | 61/2 |
| 112 | | 43/ | | | | 6 |
| 13% | -79 | | | | | 51/2 |
| 112 | 65 | 4 | | | | 5 |
| 11/2 | | 31/6 | | | | 41/2 |
| 1 8 | 43 | | | | | 4 |
| 7/ | 34 | | | | | 31/2 |
| 3.9 | 26 | 214 | | | | 3 |
| 5/ | 19 | | | | | 21/2 |
| 98 | | | 50 | | | 217 |
| 1/ | | 417 | 39 | | | 2.4 |
| 3 | | 117 | 30 | | 1.6 | 134 |
| 16 | 191 | 112 | | | | 11% |
| 8 | 191/ | 1 8 | 15 | | | 11/ |
| 16 | | 3/ | | | | 1 |
| | 23/4 21/2 21/4 21/3/4 11/2 13/8 11/4 11/8 1 1/6 1/6 1/6 1/6 1/6 1/6 1/6 1/6 1/6 1 | 2½ 2.50 2¼ 2.00 2 1.58 134 1.30 158 1.08 1½ .93 1¾ 65 1¼ 65 1¼ .65 1¼ .65 1¼ .65 1¼ .65 1¼ .65 1¼ .65 1¼ .65 1¼ .65 1¼ .65 1¼ .13 3¼ .26 5¼ .19 16 .16 14 .13 3¼ .26 5¼ .19 16 .16 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

For galvanized rope or rope with wire center, add 10 per cent.

MPROVED PLOUGH STEEL HOISTING ROPE





Fig. 2062A

SIX STRANDS OF NINETEEN WIRES EACH AND A HEMP CENTER

| Number | Diameter Inches | Price per Foot | Approximate Circumfer- ence Inches | Weight per Foot Pounds | | Proper Working Load, Tons, 2000 Pounds | Minimum Size of Drum or Sheave Feet |
|------------|--------------------|-------------------|---|------------------------------|------|---|--|
| 00 | 23/4 | 3.45 | 85% | 11.95 | 315 | 63 | 11 |
| 0 | 21/2 | 2.80 | 7 7/8 | 9.85 | 263 | 53 | 10 |
| 1 | 21/4 | 2.50 | 71/8 | 8 | 210 | 42 | 9 |
| 2 | 2 | 1.85 | 614 | 6.3 | 166 | 33 | 8 |
| 3 | 13/4 | 1.60 | 51/2 | 4.85 | 133 | 27 | 7 |
| 4 5 | 15/8 | 1.30 | 5 | 4.15 | 110 | 22 | 61/2 |
| 5 | 11/2 | 1.10 | 43/4 | 3.55 | 98 | 20 | 6 |
| 51/2 | 138 | .90 | 41/4 | 3 | 84 | 17 | 51/2 |
| 6 | 11/4 | .75 | 4 | 2.45 | 69 | 14 | 5 |
| 7 | 11/8 | .62 | 31/2 | 2 | 56 | 11 | 41/2 |
| 8 | 1 | .50 | 3 | 1.58 | 45 | 9 | 4 |
| 9 | 7/8 3/4 5/8 | .39 | 234 | 1.2 | 35 | 7.0 | 31/2 |
| 10 | 24 | .31 | 21/4 | .89 | 26.3 | 5.3 | 3 |
| 1014 | %8 | .221/2 | 19/ | .62 | 19 | 3.8 | 2/2 |
| 1012 | 18 | .19 | 134 | .5 | 14.5 | 2.9 | 21/4 |
| 10¾ 10a | 72 | .17 | 11/2 | .39 .30 | 9.4 | $\frac{2.4}{1.9}$ | 13/4 |
| 10a | 3/8 | .141/2 | 11/4 | .22 | 6.75 | 1.35 | 114 |
| 10c | 78 | .131/2 | 11/8 | .15 | 4.50 | .9 | 112 |
| 10d | 1/4 | .1372 | 3/4 | .10 | 3.15 | .63 | 1 |

For ropes of more than 19 wires to the strand and less than 37 wires, apply list for 37 wires.

EXTRA PLIABLE-SIX STRANDS OF THIRTY-SEVEN WIRES 'EACH, AND A HEMP CENTER

| | | | 110 7 1 | LIVIT OLIV | | | |
|---|-----------------|--------|----------------|------------|--------|------|----------|
| 1 | 234 | 3.75 | 85 g | 11.95 | 278 | 55 | Τ |
| | 21/2 | 3.15 | 77% | 9.85 | 225 | 45 | |
| l | $2\frac{1}{4}$ | 2.50 | 718 | 8 | 184 | 37 | . |
| | $2^{'}$ | 2.10 | 6^{1}_{4} | 6.30 | 137 | 27 | |
| | 134 | 1.75 | $5\frac{1}{2}$ | 4.85 | 113 | 23 | |
| | $15\frac{7}{8}$ | 1.45 | 5 | 4.15 | 95 | 19 | |
| | 112 | 1.25 | 434 | 3,55 | 84 | 17 | 3.75 |
| | 13 s | 1.05 | 414 | 3 | 71 | 14 | 3.50 |
| | 114 | .86 | 4 | 2.45 | j 58 . | 11 | 3.20 |
| | 1^{1} 8 | .75 | 31,2 | 2 | 46 | 9.2 | 2.83 |
| | 1 | .59 | 3 | 1.58 | 37 | 7.4 | 2.50 |
| | 7 8 | .46 | 234 | 1.20 | 29 | 5.8 | 2.16 |
| 1 | 34 | .36 | 2^{i} | .89 | 23 | 4.6 | 1.83 |
| | 5 & | .27 | 2^{-1} | .62 | 16 | 3.2 | 1,75 |
| | 18 | .23 | 134 | .50 | 1216 | 2.5 | 1.50 |
| | 1/2 | .20 | 1^{1}_{2} | .39 | 9.75 | 1.9 | 1.33 |
| | 16 | .181/2 | $1\frac{1}{4}$ | .30 | 7.50 | 1.5 | 1.15 |
| | 3/8 | 1712 | 11 8 | .22 | 5.30 | 1.06 | 1 |

For rope with more than 37 wires to the strand, add 10 per cent. For galvanized rope or rope with wire center, add 10 per cent.



EXTRA PLIABLE HOISTING ROPE



Fig. 2061A

SIX STRANDS OF THIRTY-SEVEN WIRES EACH AND A HEMP CENTER CAST STEEL

| Diameter Inches | Price per Foot | Approximate Circumference Inches | Weight per Foot Pounds | Approximate Breaking Strain, Tons 2000 Lbs. | Proper Working Load, Tons 2000 Lbs. | Minimum Size of Drun of Sheave Feet |
|----------------------------|-------------------|--|------------------------------|--|--|--|
| 23/4 | 2.30 | 85/8 | 11.95 | 200 | 40 | |
| 21/2 | 1.92 | 77/8 | 9.85 | 160 | 32 | |
| 21/4 | 1.60 | 71/8 | 8 | 125 | 25 | |
| 2 | 1.35 | 61/4 | 6.30 | 105 | 21 | |
| 13/4 | 1.05 | 51/2 | 4.85 | 84 | 17 | |
| 15% | .89 | 5 | 4.15 | 71 | 14 | |
| 112 | .79 | 43/4 | 3.55 | 63 | 12 | 3.75 |
| 13% | .65 | 414 | 3 | 55 | 11 | 3.5 |
| 11/ | .55 | 4 | 2.45 | 45 | 9 | 3.2 |
| 11% | .46 | 31/2 | 2 | 34 | 7 | 2.83 |
| 1 0 | .37 | 3 2 | 1.58 | 29 | 6 | 2.5 |
| 7/6 | .28 | 23/4 | 1.20 | 23 | 5 | 2.16 |
| 3/4 | .23 | 214 | .89 | 17.5 | 3.5 | 1.83 |
| 5/6 | .18 | 2 | .62 | 11.2 | 2.2 | 1.75 |
| 5/8 | .15 | 13/4 | .50 | 9.5 | 1.9 | 1.5 |
| 1/0 | .13 | 11/2 | .39 | 7.25 | 1.45 | 1.33 |
| 7/0 | .121/2 | 11/4 | .30 | 5.5 | 1.1 | 1.16 |
| 9/16 1/2 7/16 3/8 | .12 | 11/8 | .22 | 4.2 | .84 | 1 |

EXTRA STRONG CAST STEEL

| 23/4 | 2.80 | 85/8 | 11.95 | 233 | 47 | |
|------|------------|----------------|-------|------|------|------|
| 21/2 | 2.35 | 77/8 | 9.85 | 187 | 37 | |
| 21/4 | 1.90 | 71/8 | 8 | 150 | 30 | |
| 2 | 1.55 | 61/4 | 6.30 | 117 | 23 | |
| 13/ | 1.28 | 51/2 | 4.85 | 95 | 19 | |
| 15% | 1.07 | 5 | 4.15 | 79 | 16 | |
| 11% | .95 | 43/4 | 3.55 | 71 | 14 | 3.75 |
| 13% | .78 | 41/4 | 3 | 61 | 12 | 3.5 |
| 112 | .65 | 4 | 2.45 | 50 | 10 | 3.20 |
| 11% | .65 .55 | $3\frac{1}{2}$ | 2 | - 39 | 8 | 2.83 |
| 1 8 | .44 | 3 | 1.58 | 32 | 6 | 2.5 |
| 7/ | .34 | 23/4 | 1.20 | 25 | 5 | 2.16 |
| 3% | .27 | $2\frac{1}{4}$ | .89 | 19 | 4.9 | 1.83 |
| 5% | .21 | 2 4 | .62 | 12.6 | 2.5 | 1.75 |
| 9% | 171/ | 13/4 | .50 | 10.5 | 2.1 | 1.5 |
| 9/6 | .15 | 11/ | .39 | 8.25 | 1.65 | 1.33 |
| 72 | .14 | 11/2 | .30 | 6.35 | 1.27 | 1.16 |
| 3/8 | .13 | 11/4 | .22 | 4.65 | .93 | 1.10 |

For galvanized rope or rope with wire center, or with more than 37 wires to the strand, add 10 per cent.

TRANSMISSION AND HAULAGE ROPE





Pig. 7133A

Fig. 7133B

SIX STRANDS OF SEVEN WIRES AND A HEMP CENTER SWEDISH IRON

| Number | Diameter Inches | Price per Foot | Approximate Circumference Inches | Weight per Foot Pounds | Approximate Breaking Strain Tons 2000 lbs. | Proper Working Load Tons 2000 lbs. | Minimum Size of Drum or Sheave Feet |
|--------|---|----------------------|--|------------------------------|--|---|--|
| 11 | 1½ | .51 | 434 | 3.55 | 32 | 6.4 | 16 |
| 12 | 13 8 | .43 | 414 | 3 | 28 | 5.6 | 15 |
| 13 | 11/4 | .36 | 4 | 2.45 | 23 | 4.6 | 13 |
| 14 | 11/8 | .30 | 3½ | 2 | 19 | 3.8 | 12 |
| 15 | 1 | .24 | 3 | 1.58 | 15 | 3 | 101/2 |
| 16 | <i>7</i> ∕8 | .181/2 | 234 | 1.2 | 12 | 2.4 | 9 - |
| 17 | 34 | .14 | 214 | .89 | 8.8 | 1.7 | 71/2 |
| 18 | 11/16 | .12 | 218 | .75 | 7.3 | 1.5 | 714 |
| 19 | 58 | .10 | 2 | .62 | 6 | 1.2 | 7 |
| 20 | 9/16 | .081/4 | $1^{3}4$ | .5 | 4.8 | .96 | 6 |
| 21 | 1/2 | .061/2 | 11/2 | .39 | 3.7 | .74 | 513 |
| 22 | 76 | .051/2 | 114 | .3 | 2.6 | .52 | 412 |
| 23 | 3/8 | .041/2 | 118 | .22 | 2.2 | .44 | 4 |
| 24 | 5/6 | $.03\frac{3}{4}$ | 1 | .15 | 1.7 | .34 | 31/2 |
| 25 | 7/8/4/16/8/16/8/16/9/16/9/16/9/16/9/16/9/16/9 | .031/4 | ⁷ 8 | .125 | 1.2 | .24 | 3 - |

Siemens-Martin steel rope same list as iron rope.

CRUCIBLE CAST STEEL TRANSMISSION HAULAGE ROPE

| 11 | 11/2 | .60 | 43/4 | 3.55 | 63 | 12.6 | 11 |
|----|------|--------|------|------|------|------|------|
| 12 | 13/8 | .51 | 41/4 | 3 . | 53 | 10.6 | 10 |
| 13 | 11/4 | .43 | 4 | 2.45 | 46 | 9.2 | 9 |
| 14 | 11/8 | .36 | 31/6 | 2 | 37 | 7.4 | 8 |
| 15 | 1 | .29 | 3 | 1.58 | 31 | 6.2 | 7 |
| 16 | 7/8 | .221/2 | 234 | 1.2 | 24 | 4.8 | 6 |
| 17 | 3/4 | .17 | 21/4 | .89 | 18.6 | 3.7 | 5 |
| 18 | 11/6 | .141/2 | 21/8 | .75 | 15.4 | 3.1 | 43/4 |
| 19 | 5/8 | .12 | 2 | .62 | 13 | 2.6 | 41/6 |
| 20 | 916 | .10 | 134 | .5 | 10 | 2 | 4 |
| 21 | 1/9 | .08 | 11/2 | .39 | 7.7 | 1.5 | 31/6 |
| 22 | 7/6 | .061/6 | 11/4 | .3 | 5.5 | 1.1 | 3 |
| 23 | 3% | .051% | 11/2 | .22 | 4.6 | .92 | 23/ |
| 24 | 5/16 | .0416 | 1 | .15 | 3.5 | .70 | 214 |
| 25 | 9 32 | .04 | 7/0 | .125 | 2.5 | .50 | 13% |

For galvanized or rope with wire center, add 10 per cent.



GALVANIZED IRON WIRE ROPE

FOR SHIPS' RIGGING AND DERRICK GUYS

7-WIRE STRAND





Fig. 7134A

Fig. 7134B

SIX STRANDS OF SEVEN OR TWELVE WIRES EACH AND A HEMP CENTER

| Approxi- | PRICE I | PER FOOT | | Weight | Approximate | Circumference |
|--|---|--|--|--|---|--|
| mate Diameter Inches | With 7 Wires to Strand | With 12 Wires to Strand | Circumfer- ence Inches | per Foot Pounds | Breaking Strain Tons 2,000 Pounds | of Manila Rope of Equal Strength Inches |
| 13/41/10/8/2 11/5/8/2 11/5/8/2 11/5/8/16/8/16/8/16/8/16/8/16/8/16/8/16/ | .44 .41 .38 .35 .31½ .28½ .25 .22½ .19½ .17½ .15 .13 .09 .08 | .46 .43 .40 .37 .33½ .30½ .26½ .21 .18½ .16 | 5½ 5¼ 5 4¾ 4½ 4½ 4¼ 4 3¾ 3½ 3½ 3½ 2½ 2¼ 2½ | 4.85 4.42 4.15 3.55 3.24 3 2.45 2.21 2 1.77 1.58 1.20 1.03 .89 .62 | 42 38 35 30 28 26 23 19 18 16.1 14.1 11.1 9.4 7.8 5.7 | 11 10 ¹ / ₂ 10 9 ¹ / ₂ 9 8 ¹ / ₂ 8 7 ¹ / ₂ 6 ¹ / ₂ 6 5 ¹ / ₄ 5 4 ³ / ₄ 4 ³ / ₄ 4 ³ / ₂ |
| 11974-100 A 27 7 1 27 8 5 4 9 1 1 1 7 1 2 7 16 | .07 .06 .05 .04½ .03½ 5 Strands 7 Wires Each .03 .02½ .02½ .02¼ | 6 Strands 7 Wires Each | 134 11/2 11/4 11/8 1 | .50 .39 .30 .22 .15 .125 .09 .063 .04 | 4.46 3.39 2.35 1.95 1.42 1.20 .99 .79 | 134 114 114 114 118 |

For rope with wire center, add 10 per cent.

COPPER, IRON, TINNED, AND GALVANIZED SASH CORD Six Strands of Seven Wires Each and a Cotton Center

| Diameter | PRICE PER FOOT | | | WEIGHT PER FOOT POUNDS | | APPROXIMATE BREAKING STRAIN, POUNDS | | |
|----------|------------------|--------------------|--------|---------------------------|--------|--|----------|--------|
| Inches | Tues | Tinned or | | | 0 | Iron | | Delaht |
| 1 | Iron | Galvanized Iron | Copper | Iron | Copper | Bright | An'eal'd | Copper |
| 1/4 | .03 | .04 | .09 | .1 | .115 | 2200 | 1600 | 1265 |
| - 379 | $.02\frac{3}{4}$ | .031/2 | .071/2 | .076 | .087 | 1809 | 1254 | 1022 |
| 18 | .021/4 | .03 | .06 | .056 | .064 | 1417 | 947 | 792 |
| 18 | .013/4 | .0214 | .041/2 | .025 | .029 | 790 | 467 | 435 |
| 3 2 | .011/2 | .02 | .031/2 | .014 | .016 | 510 | 280 | 272 |
| 16 | .011/4 | .0134 | .03 | .006 | .007 | 262 | 132 | 140 |

IRON AND CAST STEEL TILLER ROPE





Fig. 1411A Fig. 1411B SIX ROPES OF SIX STRANDS OF SEVEN WIRES EACH AND A HEMP CENTER

| Diameter | Price P | er Foot | Approximate | Weight Per |
|--------------------|--------------------|-------------------|-------------------------|----------------|
| Inches | Iron | Cast Steel | Circumference Inches | Foot Pounds |
| 1,,, | .33 .27 | .43 .36 | 3 | 1.10 .84 |
| %8 34 5 8 | .21 .22 .17 | .30 .30 .24 | 214 | .62 .43 |
| 16 | .14 | .20 .17 | 134 | .35 .28 |
| 72 76 38 | .11½ .10 .09 | .15 .14 | 11/4 | .21 .16 |
| 5 16 1 | .08 .07½ | $.12\frac{1}{2}$ | 11/8 | .11 .07 |

GALVANIZED STEEL WIRE STRAND

For Smoke Stacks, Guys, Signal Strand, Trolley Span Wire, Etc.



Pig. 1411C

SEVEN WIRES TWISTED TOGETHER

| Diameter · Inches | Price Per 100 Feet | Weight Per 1000 Feet, Pounds | Approximate Breaking Strain, Pounds |
|----------------------|-----------------------|---------------------------------|--|
| 1/6 | 4.50 | 510 | 8500 |
| 3% | 3.75 | 415 | 6500 |
| 38 | 2.75 | 295 | 5000 |
| 5/16 | 2.25 | 210 | 3800 |
| 1,0 | 1.75 | 125 | 2300 |
| 7 | 1.50 | 95 | 1800 |
| 3/6 | 1.25 | 75 | 1400 |
| Æ | 1.15 | 55 | 900 |
| 1,2 | 1.00 | 32 | 500 |
| 18 T | .80 | 20 | 400 |

PRICES FOR SPLICING ROPE TO MAKE ENDLESS

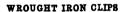
| Diameter of Ropeinches | 14 to 5/6 | 38 to 7/6 | ½ to ¾ | 3/8 to 11/8 | 1¼ to 1½ |
|------------------------|-----------|-----------|--------|-------------|----------|
| Price for Splicing | 2.50 | 3.00 | 3.50 | 4.00 | 4.50 |

The charge named is in addition to the charge made for rope used in making the splice, and applies only on wire rope spliced at the works of the manufacturer.

Special charge will be made for splicing done elsewhere; such charge depending on the circumstances of each individual case.

WIRE ROPE FASTENINGS

CROSBY CLIPS



PATENT CLAMPS







Fig. 1413B

Pig. 14130

CROSBY AND WROUGHT IRON CLIPS

| Diameter of Ropeinches Price, Crosby Clipseach " Wrought Iron Clips" | .35 | .35 .35 | .40 | | .55 .55 | 34 .65 .65 | 7/s .75 .75 | .85 .85 |
|--|------------|--------------|--------------|--------------|--------------|------------------|-------------------|----------------|
| Diameter of Ropeinches | 11/8 | 114 | 138 | 11/2 | 13/4 | 2 | 214 | 21/2 |
| Price, Crosby Clipseach "Wrought Iron Clips" | .95 .95 | 1.10 1.10 | 1.25 1.25 | 1.50 1.50 | 5.50 5.50 | 7.50 7.50 | 9.50 9.50 | 11.50 11.50 |

PATENT CLAMPS

| Diameter of Rope inches | 34 | 5/6 | 3/8 | 7/16 | 1/2 | 96 | 5/8 | 11/6 | 3⁄4 | 7/8 | 1 |
|--------------------------|------|------|------|------|------|------|------|-------|-------|------------|------|
| Priceeach | .30 | .30 | .45 | .45 | .60 | .60 | .90 | .90 | 1.05 | 1.30 | 1.75 |
| Diameter of Rope, inches | | | | | | | | | | | |
| Priceeach | 1.90 | 2.50 | 3.80 | 3.80 | 5.50 | 5.50 | 8.50 | 13.75 | 15.00 | 16.50 | |

HEAVY GALVANIZED OVAL THIMBLES



Fig. 1413D

| Circumference of Ropeinches | 34 | 1_ | 118 | 11/4 | 11/2 | 134 | 2 |
|--------------------------------|-----------|------------|------------|------------|-----------|-------------|------------|
| Width, Score inches Price each | .08 | 5/6 .08 | 3/8 .09 | ₹⁄6 .10 | ½ .11 | % .12 | 5/8 .13 |
| Circumference of Ropeinches | 214 | 234 | 3 | 31/2 | 4 | 414 | 43/4 |
| Width, Score inches Price each | 34 .15 | 7/8 .16 | .20 | 1½ .25 | 1¼ .33 | 13/8 .42 | 1½ .50 |

THIMBLES SPLICED ON ROPE



Fig. 1413E

| Diameter of Ropeinches | 34 | 5/6 | 38 | 76 | 1/2 | 916 | 58 |
|---------------------------|---------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Price, for Iron Rope each | 1.00 1.10 | 1.00 1.10 | 1.05 1.15 | 1.10 1.20 | 1.15 1.25 | 1.20 1.30 | 1.45 1.55 |
| Diameter of Ropeinches | 34 | 7/8 | 1 | 118 | 14 | 138 | 11/2 |
| Price, for Iron Rope each | $\frac{1.85}{2.00}$ | 2.40 2.55 | 2.85 3.00 | 3.65 3.90 | 4.35 4.70 | 5.25 5.75 | 6.00 6.50 |

WIRE ROPE FASTENINGS

CLOSED SOCKETS



Fig. 1414A

| Diameter of Ropeinches | 14 | 16 | 3/8 | 78 | 1/2 | 16 | 5/8 | 3/4 | 7/8 |
|---|--------------|--------------|--------------|---------------|---------------|----------------|----------------|----------------|----------------|
| Loose, for Iron or Steel Rope each Fastened, for Iron or Steel Rope " | .70 1.60 | .70 1.60 | .85 1.85 | .85 2.00 | 1.10 2.25 | $1.10 \\ 2.35$ | 1.35 2.65 | 1.65 3.15 | 1.85 3.85 |
| Diameter of Rope inches | 1 | 11/8 | 14 | 13/8 | 11/2 | 15% | 13/4 | 2 | 214 |
| Loose, for Iron or Steel Rope each Fastened, for Iron or Steel Rope " | 2.40 4.65 | 3,37 6.15 | 4.50 8.10 | 6.00 10.25 | 6.80 11.80 | 12.00 18.00 | 13.00 21.00 | 16.00 25.50 | 21.00 32.00 |

OPEN SOCKETS



Fig. 1414B

| Diameter of Rope inches | 1/4 | 1 A | 3/8 | 77.7 | 1/2 | 1 ⁹ 4 | 5/8 | 34 | 7/8 |
|---|--------------|--------------|---|---------------|----------------|------------------|------------------------|----------------|----------------|
| Loose, for Iron or Steel Rope each Fastened, for Iron or Steel Rope " | .85 1.75 | .85 1.75 | $\begin{array}{c} \textbf{1.00} \\ \textbf{2.00} \end{array}$ | 1.00 2.15 | $1.35 \\ 2.50$ | 1.35 2.60 | 1.65 2.85 | 2.10 3.60 | 2.50 4.50 |
| Diameter of Ropeinches | 1 | 118 | 114 | 13% | 11/2 | 15% | 134 | 2 | 214 |
| Loose, for Iron or Steel Rope each Fastened, for Iron or Steel Rope " | 3.15 5.40 | 4.50 7.35 | 6.10 9.60 | 7.50 11.75 | 8.00 13.00 | 13.00 19.00 | 15.50 23.5 0 | 16.50 26.00 | 23.00 34.00 |

HOOK AND THIMBLE



Fig. 1414C

HOOKS AND THIMBLES AND SISTER HOOKS AND THIMBLES

| Diameter of Rope inches | 1/4 | , B | 3/8 | 178 | 1/2 | 1,4 | % |
|--|------|------------|------|------|------|-------|-------|
| Loose, for Iron Ropeeach | .50 | .50 | .55 | .60 | .65 | .75 | .85 |
| Fastened for Iron Rone " | 1 50 | 1.50 | 1.60 | 1.70 | 1.80 | 11.95 | 2.20 |
| Loose, for Steel Rope | .65 | .65 | .70 | .75 | .80 | 1.10 | 1.40 |
| Loose, for Steel Rope. " Fastened, for Steel Rope. " | 1.75 | 1.75 | 1.85 | 1.95 | 2.05 | 2.40 | 2.85 |
| Diameter of Ropeinches | 3/4 | ₹ 8 | 1 | 11/8 | 11/4 | 13/8 | 11/2 |
| Loose, for Iron Ropeeach | 1.10 | 1.40 | 1.90 | 2.40 | 2.65 | 3.40 | 5.00 |
| Fastened, for Iron Rope " | 2.85 | 3.70 | 4.65 | 5,90 | 6.90 | 8.65 | 11.00 |
| Loose, for Steel Rope | 1.85 | 2.90 | 3,75 | 4.40 | 4.60 | 5.40 | 7.00 |
| Fastened, for Steel Rope" | 3.75 | 5.35 | 6.70 | 8.15 | 9.20 | 11.15 | 13.50 |

WIRE ROPE FASTENINGS

HOOK AND SOCKET



SWIVEL HOOK AND SOCKET



Fig. 1415B

HOOKS AND SOCKETS

| Diameter of | of Ropeinches | 14 | 5/16 | 3/8 | 1/16 | ⅓ | % 6 | 5∕8 [°] |
|-------------|-------------------------|------|----------|------|-------------|-------|------------|------------------|
| Price, Loo | se, for Iron Ropeeach | 1.25 | 1.25 | 1.50 | 1.55 | 1.95 | 2.00 | 2.30 |
| " Fast | tened, for Iron Rope " | 2.15 | 2.15 | 2.50 | 2.70 | 3.10 | 3.25 | 3.60 |
| " Loo | se, for Steel Rope " | 1.45 | 1.45 | 1.65 | 1.70 | 2.10 | 2.45 | 2.90 |
| " Fast | tened, for Steel Rope " | 2.35 | 2.35 | 2.65 | 2.85 | 3.25 | 3.70 | 4.20 |
| Diameter | of Ropeinches | 34 | ½ | 1 | 11/8 | 11/4 | 13% | 11/2 |
| Price, Loo | se, for Iron Ropeeach | 3.00 | 3.70 | 4.60 | 6.25 | 8.00 | 10.25 | 12.50 |
| " Fast | tened, for Iron Rope " | 4.50 | 5.70 | 6.85 | 9.10 | 11.50 | 14.50 | 17.50 |
| " Loo | se, for Steel Rope " | 3.85 | 5.25 | 6.50 | 8.25 | 10.00 | 12.30 | 14.50 |
| " Fast | tened, for Steel Rope " | 5,35 | 7.25 | 8.75 | 11.10 | 13.50 | 16.55 | 19.50 |

SWIVEL HOOKS AND SOCKETS

| Diameter of Ropeinches | 1/4 | 5/16 | 38 | ₹ ⁄16 | 1/2 | 916 | 5/8 |
|---------------------------------|------|-------------|---------------|--------------|-------|-------|-------|
| Price, Loose, for Iron Ropeeach | 2.00 | 2.00 | 2.35 | 2.55 | 3.00 | 3.00 | 3.60 |
| " Fastened, for Iron Rope " | 2.90 | 2.90 | 3.35 | 3.70 | 4.15 | 4.25 | 4.90 |
| " Loose, for Steel Rope " | 2.30 | 2.30 | 2.70 | 2.85 | 3.55 | 3.75 | 4.60 |
| " Fastened, for Steel Rope " | 3.20 | 3.20 | 3.70 | 4.00 | 4.70 | 5.00 | 5.90 |
| Diameter of Ropeinches | 34 | 1 /8 | 1 | 11/8 | 1¼ | 138 | 1½ |
| Price, Loose, for Iron Ropeeach | 4.00 | 4.75 | 5.70 | 9.00 | 13.50 | 17.00 | 22.00 |
| " Fastened, for Iron Rope " | 5.50 | 6.75 | 7. 95 | 11.85 | 17.00 | 21.25 | 27.00 |
| " Loose, for Steel Rope " | 5.25 | 7.00 | 8.35 | 12.00 | 17.00 | 21.00 | 27.00 |
| " Fastened, for Steel Rope " | 6.75 | 9.00 | 10.6 0 | 14.85 | 20.50 | 25.25 | 32.00 |

SHEAVES FOR WIRE ROPE

TRANSMISSION, RUBBER AND LEATHER LINED GROOVES

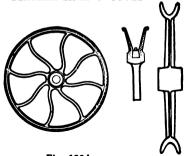




Fig. 180A

TRANSMISSION

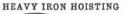
Fig. 180B

| Diameter at Bottom of Groove feet | 11/2 | 2 | 21/2 | 3 | 4 | 5 | 6 |
|-----------------------------------|-------|-------|--------|--------|--------|--------|-------|
| Priceeach | 5.50 | 7.50 | 10.50 | 15.00 | 24.00 | 37.00 | 59.00 |
| Diameter at Bottom of Groove feet | 7 | 8 | 9 | *10 | *11 | *12 | |
| Priceeach | 72.00 | 95.00 | 120.00 | 150.00 | 220.00 | 235.00 | |

*Cast in halves; all others solid unless otherwise specified.

LIGHT ARM SUPPORTING

| Diameter at Bottom of Grooveinches | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
|------------------------------------|------|------|------|------|------|------|------|------|------|-------|
| Priceeach | 2.50 | 2.80 | 3.40 | 3.60 | 4.40 | 5.80 | 6.00 | 8.00 | 9.00 | 11.00 |



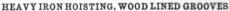










Fig. 180C

HEAVY IRON HOISTING

Fig. 180D

| 171/8 | 201/8 | 23 | 26 | 29 |
|-------|-------|---------------------|---|--|
| 5.00 | 6.50 | 7.75 | 10.00 | 12.00 |
| 35 | 463/4 | 581/2 | 701/4 | |
| 21.00 | 32.00 | 45.00 | 63.00 | |
| | 5.00 | 5.00 6.50 35 46¾ | 5.00 6.50 7.75 35 46¾ 58½ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

IRON HOISTING (Not Illustrated)

| Diameter at Bottom of Groove inch | | | | | | | |
|-----------------------------------|-----|------|------|------|------|------|------|
| Price ea | ich | 1.75 | 2.25 | 2.50 | 3.00 | 5.00 | 8.00 |

HEAVY IRON HOISTING, WOOD LINED GROOVES

| Diameter at Bottom of Groove | . feet | 3 | 4 | 5 | 6 |
|------------------------------|--------|-------|-------|-------|--------|
| Price | each | 45.00 | 60.00 | 72.00 | 130.00 |

STEEL SHAFTING

TURNED AND POLISHED



Fig. 3435A

| Diam. Inches | Price per Pound | Weight per Foot Pounds | Price per Foot | Dlam. Inches | Price per Pound | Weight per Foot Pounds | Price per Foot | Diam. Inches | Price per Pound | Weight per Foot Pounds | Price per Foot |
|--|-----------------------|------------------------------|----------------------|-----------------|-----------------------|------------------------------|----------------------|-----------------|-----------------------|------------------------------|----------------------|
| 3/6 1/4 5/6 | .10 | .094 | .01 | 2 | .05 | 10.68 | .54 | 313/6 | .05½ | 38.81 | 2.13 |
| 14 | .10 | .167 | .02 | 21/6 | .05 | 11.36 | .57 | 37/8 | .051/6 | 40.10 | 2.20 |
| 316 | .081/2 | .261 | .02 | 21/8 | .05 | 12.06 | .61 | 315/16 | $.05\frac{1}{2}$ | 41.40 | 2.27 |
| 38 | .07 | .376 | .03 | 23/6 | .05 | 12.78 | .65 | 4 | .06 | 42.73 | 2.57 |
| 7/6 | .07 | .511 | .04 | 21/4 | .05 | 13.52 | .68 | 41/8 | .06 | 45.44 | 2.73 |
| 1/2 | .07 | .668 | .05 | 256 | .05 | 14.28 | .72 | 4 3/6 | .06 | 46.83 | 2.85 |
| 216 | .06 | .845 | .06 | 23/8 | .05 | 15.07 | .76 | 434 | .08 | 48.24 | 2.90 |
| 3 8 8 7 16 7 16 1 22 9 16 5 8 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | .06 | 1.043 | .07 | 276 | .05 | 15.86 | .80 | 43/8 | .06 | 51.11 | 3.11 |
| 11/26 | .06 | 1.262 | .08 | 21/2 | .05 | 16.69 | .84 | 4 1/16 | .06 | 52.58 | 3.16 |
| 34 | .051/2 | 1.502 | .09 | 2916 | .05 | 17.35 | .88 | 41/2 | .061⁄2 | 54.07 | 3.52 |
| 13/6 | .0512 | 1.763 | .10 | 25% | .05 | 18.40 | .93 | 45% | $.06\frac{1}{2}$ | 57.12 | 3.71 |
| <i>7</i> ∕8 | $.05\frac{1}{2}$ | 2.044 | .12 | 2116 | .05 | 19.29 | .97 | 411/16 | .061/2 | 58.67 | 3.82 |
| 15/16 | .051/2 | 2.347 | .13 | 234 | .05 | 20.20 | 1.02 | 434 | $.06\frac{1}{2}$ | 60.25 | 3.96 |
| 1 | .0512 | 2.670 | .15 | 2136 | .05 | 21.12 | 1.06 | 4 % | $06\frac{1}{2}$ | 63.46 | 4.12 |
| 11/6 | $.05\frac{1}{2}$ | 3.014 | .17 | 2 1/8 | .05 | 22.07 | 1.11 | 415/16 | .061/2 | 65.10 | 4.26 |
| 11/8 | .051/2 | 3.379 | .19 | $2\frac{1}{16}$ | .05 | 23.04 | 1.16 | 5 | .07 | 66.76 | 4.72 |
| 13% | .051/2 | 3.766 | .21 | 3 | .05 | 24.03 | 1.21 | 51/8 | .07 | 70.14 | 4.91 |
| 11/4 | .051/2 | 4.173 | .23 | 31/6 | .051/4 | 25.04 | 1.31 | 53/6 | .07 | 71.86 | 5.03 |
| 156 | .05% | 4.600 | .26 | 31/8 | .051/4 | 26.08 | 1.37 | 514 | .07 | 73.60 | 5.15 |
| 13/8 | .0512 | 5.019 | .28 | 33/6 | .051/4 | 27.13 | 1.43 | 53/8 | .07 | 77.15 | 5.40 |
| 17/6 | .051/2 | 5.518 | .31 | 31/4 | .0514 | 28.20 | 1.49 | 576 | .07 | 78.95 | 5.53 |
| $\frac{117}{2}$ $\frac{196}{196}$ | .05 | 6.008 | .31 | 35/6 | .051/4 | 29.30 | 1.54 | 51/2 | .071/2 | 80.77 | 6.06 |
| 1% | .05 | 6.520 | .33 | 33/8 | .0514 | 30.42 | 1.60 | 558 | .071/2 | 84.49 | 6.34 |
| 158 | .05 | 7.051 | .36 | 37/6 | $.05^{1}_{4}$ | 31.56 | 1.66 | 511/6 | .071/2 | 86.38 | 6.48 |
| 1116 | .05 | 7.604 | .39 | 31/2 | .051/2 | 32.71 | 1.81 | 534 | .0712 | 88.29 | 6.62 |
| 134 | .05 | 8.178 | .41 | 3% | .051/2 | 33.90 | 1.86 | 578 | .0712 | 92.17 | 6.91 |
| 113/6 | .05 | 8.773 | .44 | 358 | .051/2 | 35.09 | 1.94 | 515 | .0712 | 94.14 | 7.06 |
| 178 | .05 | 9.388 | .47 | 31/6 | .051/2 | 36.31 | 2.01 | ∥ 6 | .08 | 96.14 | 7.69 |
| 1^{15} | .05 | 10.02 | .51 | 334 | $05\frac{1}{2}$ | 37.56 | 2.07 | | | 1 | 1 |

Extras.—For Shafts 6 to 11% inches long, $\frac{1}{2}$ cent per pound net extra.

For Shafts 3 to 5¾ inches long, 1 cent per pound net extra.

For Shafts shorter than 3 inches, special prices will be quoted.

For Shafts over 24 feet long and less than 30 feet, ½ cent per pound net extra.

Boxing at cost.

KEY-SEATING SHAFTING, ETC. KEY-SEATING AND SHOULDERING SHAFTING

| Diameter of Shaft Inches | Key-Seat Width Inches | Depth Inches | Key-Seat- ing 1 Foot or less for C'upl'ngs per End | Key-Seat- ing Full Length | Splines per Foot or less | Middle Splines Each Addt'l Foot | Extra for Squaring Ends, per Key-Seat | ers or Journals | *Should- ers Each Addt'l Foot |
|--|--|---|---|---------------------------------|--------------------------------|---|--|----------------------|--|
| 34 to 114 156 " 134 136 " 214 | 1/4 3/8 1/2 | 1/8 3/6 1/4 | .35 .40 .45 | .20 .25 .30 | .75 .80 1.00 | .20 .25 .30 | 1.00 1.00 1.20 | .75 .80 1.00 | .50 .50 .75 |
| 25% " 234 2136 " 34 356 " 334 | 1/2 5/8 3/4 7/8 | 5/6 3/8 7/6 | .70 .95 1.25 | .35 .45 .60 | 1.30 1.55 1.80 | .35 .45 .60 | 1.40 1.60 1.80 | 1.30 1.55 1.80 | 1.05 1.15 1.30 |
| 3 ¹³ / ₁₆ 4 4 4 ⁵ / ₁₆ 4 ³ / ₄ 4 ¹³ / ₁₆ 5 ¹ / ₄ | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 1/8 3/6 1/4 5/6 3/8 7/6 1/2 9/6 5/8 11/6 | 1.50 1.65 2.00 | .80 .90 1.20 | 2.05 2.25 2.50 | .80 .90 1.20 | 2.00 2.20 2.40 | 2.05 2.25 2.50 | 1.55 1.75 1.85 |
| 55% 514 5136 64 656 714 | $1\frac{3}{8}$ $1\frac{1}{2}$ $1\frac{3}{4}$ | 3/4 | 2.20 2.40 2.70 | 1.35 1.50 1.80 | 2.75 3.00 3.35 | 1.35 1.50 1.80 | 2.60 2.80 3.00 | 2.75 3.00 3.35 | 2.10 2.20 2.55 |
| 75/6 " 81/4 85/6 " 91/4 95/6 " 101/4 | 21/4 21/4 2/2 | 3/4/4 3/4/8 7/8/8/8 7/8 | 3 20 3.70 4.30 | 2.55 3.35 4.15 | 3.85 4.35 4.85 | 2.55 3.35 4.15 | 3.60 4.20 4.80 | 3.85 4.35 4.85 | 3.10 3.70 4.30 |
| 105/6 " 111/4 115/6 " 121/4 | 2 ¹ / ₄ 3 | 78 78 78 | 4.90 5.55 | 4.80 5.35 | 5.45 6.10 | 4.80 5.35 | 6.00 7.20 | 5.45 6.10 | 4.90 5.55 |

*For reducing Shatt not to exceed one-half its own diameter.

COLD FINISHED STEEL SQUARES FOR KEYS, SPLINES, ETC.

| Square Inches | Weight per Foot, Pounds | Price per Pound | Square Inches | Weight per Foot, Pounds | Price per Pound | Square Inches | Weight per Foot, Pounds | Price per Pound |
|---|-------------------------------|--------------------|------------------|-------------------------------|--------------------|------------------|-------------------------------|--------------------|
| 1/4 | .212 | .12 | 11/8 | 4.303 | .08 | 2 | 13.60 | .08 |
| 876 | .333 | .12 | 13/6 | 4.795 | .08 | 21/6 | 14.46 | .08 |
| 3% | .478 | .12 | 11/4 | 5.312 | .08 | 21/8 | 15.35 | .08 |
| 7/a | .651 | .12 | 15/6 | 5.857 | .08 | 23/6 | 16.27 | .08 |
| 1% | .850 | .10 | 138 | 6.428 | .08 | 21/4 | 17.22 | .08 |
| 9% | 1.076 | .10 | 17/6 | 7.026 | .08 | 25/6 | 18.19 | .08 |
| 5/8 | 1.328 | .10 | 1½ | 7.650 | .08 | $2\frac{3}{8}$ | 19.18 | .08 |
| 1176 | 1.608 | .10 | 1%6 | 8.301 | .08 | 276 | 20.20 | .08 |
| 34 | 1.913 | .08 | 15/8 | 8.978 | .08 | 21/6 | 21.25 | .08 |
| 1376 | 2.245 | .08 | 1116 | 9.682 | .08 | 25/8 | 23.43 | .08 |
| 7% | 2.603 | .08 | 134 | 10.41 | .08 | 234 | 25.00 | .08 |
| 5/6/8/6/4/6/8/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/8/6/4/6/4 | 2.959 | .08 | 1136 | 11.17 | .08 | 215 | 29.34 | 08 |
| 1 " | 3.400 | .08 | 1 1/8 | 11.95 | .08 | 3 | 30.60 | .08 |
| 11/6 | 3.838 | .08 | 11% | 12.76 | .08 | 1 | 1 | 1 |

COLD DRAWN STEEL HEXAGONS

| Sı | 7.E | Weight per Foot | Price per | | | Weight per Foot | Price per | Sı | ZE | Wt. per Foot | Price |
|---|-----------------|--------------------|------------------|--|-----------------|--------------------|------------------|--------|-----------|-----------------|-------|
| Inches | M. M. | Pounds | Pound | Inches | M. M. | Pounds | Pound | Inches | M. M. | Pounds | Pound |
| 1/4 | 61/2 | .195 | .10 | 5/8 | 16 | 1.15 | $.07\frac{1}{2}$ | 13/16 | 30 | 4.15 | .07 |
| 37 | 7 | .23 | .10 | 11/6 | 171/2 | 1.40 | $.07\frac{1}{2}$ | 11/4 | 32 | 4.60 | .07 |
| 1/4 9 37 5/6 | 8 | .29 | .10 | 272 732 134 136 7 282 7 282 | 18 | 1.52 | $.07\frac{1}{2}$ | | 331/2 | 5.07 | .07 |
| 3 8 | 9 | .36 | .10 | 3/4 | 19 | 1.66 | $.07\frac{1}{2}$ | 13/8 | 35 | 5.57 | .07 |
| 3 8 | 91/2 | .43 | .08 | 13/16 | $20\frac{1}{2}$ | 1.91 | $.07\frac{1}{2}$ | | 361/2 | 6.07 | .07 |
| $\frac{13}{32}$ | $10\frac{1}{2}$ | .50 | .08 | 7/8 | $2\frac{1}{2}$ | 2.25 | .07 | 11/2 | 38 | 6.62 | .07 |
| 7/16 | 11 | .56 | .08 | 32 | 23 | 2.40 | .07 | 1916 | 40 | 7.17 | .07 |
| 32 | 12 | .64 | .08 | 15/6 | 24 | 2.58 | .07 | 15 8 | 41 | 7.76 | .07 |
| 1/2 | 13 | .73 | .08 | 1 1 | $\frac{251}{2}$ | 2.94 | .07 | 111/6 | 43 | 8.37 | .07 |
| 32 | 131/2 | .82 | .08 | 116 | 27 | 3.33 | .07 | 134 | 44½ 48 | 9.00 | .07 |
| 137/16532/27/2/16522 177/1532/27/2/16522 | 141/2 | .93 | $.07\frac{1}{2}$ | 13 | 28 | 3.52 | .07 | 178 | 40 | 10.32 | .07 |
| 32 | 15 | 1.10 | $.07\frac{1}{2}$ | 11/8 | 281/2 | 3.73 | .07 | | • • • • | 1 | |

DODGE WOOD SPLIT PULLEYS

| Inches | | | | | - 8 | WIDT | H OF FA | CE, INC | CHES | | | | |
|--------|--------|-------|-------|-------|--------|--------|---------|---------|--------|--------|-----------------|--------|-------|
| Inc | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 |
| 4 | 2.80 | 2.90 | 3.10 | | | 4.10 | 4.50 | | | | | | |
| 5 | 2.85 | 2.95 | 3.20 | | | 4.30 | 4.75 | | | | | | |
| 6 | 2.90 | 3.00 | | | | 4.50 | 5.00 | | | | | | |
| 7 | 2.95 | 3.05 | | | | 4.70 | 5.25 | 5.80 | | | | | |
| 8 | 3.00 | 3.10 | | | | 4.90 | 5.50 | 6.10 | | | | | |
| 9 | 3.10 | 3.25 | 3.60 | 3.90 | 4.55 | 5.20 | 5.85 | 6.50 | | | | | |
| | 3.25 | 3.40 | 3.75 | 4.10 | 4.80 | 5.50 | 6.20 | 6.90 | 7.60 | | | | |
| 11 | 3.50 | 3.70 | 4.10 | 4.50 | 5.30 | 6.10 | 6.90 | 7.70 | | | | | |
| 12 | 3.75 | 4.00 | 4.45 | 4.90 | 5.80 | 6.70 | 7.60 | 8.50 | | 10.30 | | | |
| 13 | | 4.30 | -4.80 | 5.30 | 6.30 | 7.30 | 8.30 | 9.30 | | 11.30 | | | |
| 14 | | 4.60 | 5.15 | 5.70 | 6.80 | 7.90 | 9.00 | 10.10 | 11.20 | 12.30 | | | |
| 15 | | 4.90 | 5.50 | 6.10 | 7.30 | 8.50 | 9.70 | 10.90 | | 13.30 | | | |
| 16 | | 5.20 | 5.85 | 6.50 | 7.80 | 9.10 | 10.40 | 11.70 | 13.00 | 14.30 | | 16.90 | |
| 17 | | 5.50 | 6.20 | 6.90 | 8.30 | 9.70 | 11.10 | 12.50 | | 15.30 | 16.70 | 18.10 | |
| 18 | | 5.80 | 6.55 | 7.30 | 8.80 | 10.30 | 11.80 | 13.30 | 14.80 | 16.30 | 17.80 | 19.30 | 90 |
| 19 | | 6.10 | 6.90 | 7.70 | 9.30 | 10.90 | 12.50 | 14.10 | 15.70 | 17.30 | | | 20. |
| 20 | | 6.40 | 7.25 | 8.10 | 9.80 | 11.50 | 13.20 | 14.90 | | | 18.90 | 20.50 | 22. |
| 22 | | 7.00 | 7.95 | 8.90 | 10.80 | 12.70 | 14.60 | | 16.60 | 18.30 | 20.00 | 21.70 | 23. |
| 24 | | 7.70 | 8.80 | | 12.10 | 14.30 | | 16.50 | 18.40 | 20.30 | 22.20 | 24.10 | 26. |
| 26 | | 8.40 | | 10.90 | 13.40 | 15.90 | 16.50 | 18.70 | 20.90 | 23.10 | 25.30 | 27.50 | 29. |
| 28 | 1 | | 10.50 | | | | 18.40 | 20.90 | 23.40 | 25.90 | 28.40 | 30.90 | 33. |
| 30 | | | 11.35 | | 14.70 | 17.50 | 20.30 | 23.10 | 25.90 | 28.70 | 31.50 | 34.30 | 37. |
| 32 | | | | | 16.00 | 19.10 | 22.20 | 25.30 | 28.40 | 31.50 | 34.60 | 37.70 | 40. |
| 34 | | 10.50 | | | 17.30 | 20.70 | 24.10 | 27.50 | 30.90 | 34.30 | 37.70 | 41.10 | 44. |
| | | 11.30 | | | 18.70 | 22.40 | 26.10 | 29.80 | 33.50 | 37.20 | 40.90 | 44.60 | 48.3 |
| 36 | 100000 | 12.10 | | | 20.10 | 24.10 | 28.10 | 32.10 | 36.10 | 40.10 | 44.10 | 48,10 | 52. |
| 220 | | | | 17.20 | 21.50 | 25.80 | 30.10 | 34.40 | 38.70 | 43.00 | 47.30 | 51.60 | 55.9 |
| 10 | | | | 18.30 | 22.90 | 27.50 | 32.10 | 36.70 | 41.30 | 45.90 | 50.50 | 55.10 | 59. |
| 12 | | | | 19.60 | 24.60 | 29.60 | 34.60 | 39.60 | 44.60 | 49.60 | 54.60 | 59.60 | 64.6 |
| 14 | | | | 20.90 | 26.30 | 31.70 | 37.10 | 42.50 | 47.90 | 53.30 | 58.70 | 64.10 | 69. |
| 16 | | | | 22.30 | 28.10 | 33.90 | 39.70 | 45.50 | 51.30 | 57.10 | 62.90 | 68.70 | 74. |
| 18 | | | | 23.80 | 30.00 | 36.20 | 42.40 | 48.60 | 54.80 | 61.00 | 67.20 | 73.40 | 79. |
| 50 | | | | 25.40 | 32.00 | 38.60 | 45.20 | 51.80 | 58.40 | 65.00 | 71.60 | 78.20 | 84. |
| 52 | | | | 27.10 | 34.10 | 41.10 | 48.10 | 55.10 | 62.10 | 69.10 | 76.10 | 83.10 | 90. |
| 14 | | | | 28.90 | 36.30 | 43.70 | 51.10 | 58.50 | 65.90 | 73.30 | 80.70 | 88.10 | 95. |
| 6 | | | | 30.80 | 38.60 | 46.40 | 54.20 | 62.00 | 69.80 | 77.60 | 85.40 | 93.20 | |
| 58 | | | | 32.80 | 41.00 | 49.20 | 57.40 | 65.60 | 73.80 | 82.00 | 90.20 | 98.40 | |
| 60 | | | | 34.90 | 43.50 | 52.10 | 60.70 | 69.30 | 77.90 | 86.50 | | 103.70 | |
| 32 | | | | 37.10 | 46.10 | 55.10 | 64.10 | 73.10 | 82.10 | | 100.10 | | |
| 34 | | | | 39.40 | 48,80 | 58.20 | 67.60 | 77.00 | 86.40 | | 105.20 | | |
| 36 | | | | 41.90 | 51.80 | 61.70 | 71.60 | 81.50 | | | 103.20 111.20 | | |
| 38 | | | | 44.50 | 54.90 | 65.30 | 75.70 | 86.10 | | | | | |
| 70 | | | | 47.20 | 58.10 | 69.00 | 79.90 | | | | 117.30 | | |
| 12 | | | | 50.00 | 61.40 | 72.80 | | | | | 123.50 | | |
| 18 | 2.7.0 | | | 2000 | | | 84.20 | 90,60 | 107.00 | 118.40 | 129.80 | 141.20 | 152. |
| 34 | | | | | 71.90 | 84.80 | 91.10 | 110.60 | 123.50 | 136.40 | 149.30 | 162.20 | 175. |
| 90 | | | | | 83.30 | 91.10 | 112.10 | 126,50 | 140.90 | 155.30 | 169.70 | 184.10 | 198. |
| 0.50 | | **** | | | 95.60 | 06.111 | 127.40 | 143.30 | 159.20 | 175.10 | 191.00 | 206.90 | 222. |
| 16 | | | | | 109.00 | 126.50 | 144.00 | 161.50 | 179.00 | 196.50 | 214.00 | 231 50 | 249 |
|)2 | | | | | 123.70 | 143.00 | 162.30 | 181,60 | 200.90 | 220.20 | 239.50 | 258.80 | 278. |
|)8 | | | | | 139.30 | 160.40 | 181.50 | 202.60 | 223.70 | 244.80 | 265.90 | 287.00 | 308. |
| 4 | | | | | 155.80 | 178.70 | 201.60 | 224.50 | 247.40 | 270.30 | 293 20 | 316 10 | 339 (|
| 20 | | | | | 173.20 | 197 90 | 222 60 | 247 30 | 979 00 | 296 70 | 321 40 | 246 10 | 270 |

ONEIDA STEEL SPLIT **PULLEYS** 12 TO 20 INCH 21 INCH UPWARDS

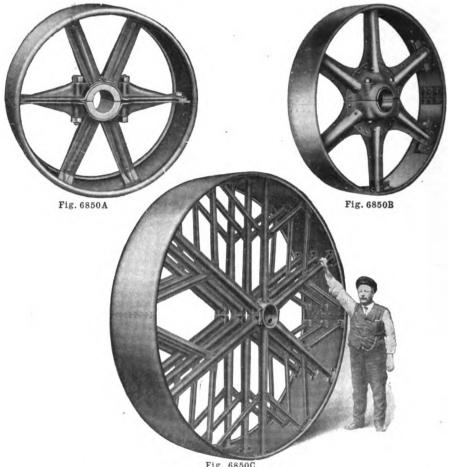


Fig. 6850C STANDARD BORES

Pulleys 6 and 7-inch diameter, 27 inch bore. Pulleys 8 to 34-inch diameter, 31/2. inch bore.

Pulleys 36 to 48-inch diameter inclusive, $3\frac{1}{2}$ or $4\frac{7}{16}$ -inch bore according to width of face.

Pulleys 48 to 60-inch diameter inclusive $4\frac{7}{16}$ -inch bore.

Pulleys larger than 60-inch diameter take either 4,6,612, or 81/2-inch bore as

18-inch and larger made for 4.7s, 6½ or 8½-inch bore at extra cost.

Interchangeable bushing allows each hub to be bushed down to fit any standard shaft

MADE FROM THE BEST GRADE SHEET STEEL OBTAINABLE

It is the strongest pulley made and yet the lightest metal pulley, weighing about the same as wood pulley. Stands high speed safely. The spokes do not fan the air like a wood pulley. When the pulley is once clamped on the shaft compression forms a permanent fastening until the hub bolts are deliberately loosened.

ONEIDA PRESSED STEEL SPLIT PULLEYS

| Diameter | | | | | Width of | FACE, IN | CHES | | | |
|--|------------------|--------|----------------|-----------|---------------|---------------|--------|---------------|---------------|--------|
| Inches | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| 6 | 3,30 | 3.45 | 3,75 | 4.05 | | | | | | |
| 7 | 3.38 | 3.60 | 3.90 | 4.20 | | | | | | |
| 8 | 3.45 | 3.75 | 4.05 | 4.35 | 4.95 | 5.60 | | | | |
| 9 | 3.60 | 3.90 | 4.20 | 4.50 | 5.10 | 5.75 | | | | |
| 10 | 3.75 | 4.05 | 4.35 | 4.65 | 5,25 | 5.90 | 6.45 | | | |
| 11 | 3.90 | 4.20 | 4.50 | 4.80 | 5.40 | 6.00 | 6.90 | | | |
| 12 | 4.20 | 4.63 | 4.80 | 5.33 | 5.78 | 6.45 | 7.65 | 9.00 | 10.25 | |
| 13 . | 4.35 | 4.80 | 5.20 | 5.62 | 6.43 | 7.20 | 8.40 | 9.50 | 10.75 | |
| | 4.50 | 5.20 | 5.65 | 6.15 | 7.05 | 8.03 | 9.00 | 10.00 | 11.25 | |
| 15 % | 4.65 | 5.45 | 5.80 | 6.55 | 7.65 | 8.80 | 9.75 | 10.75 | 12.00 | |
| 16 0 | 4.95 | 5.75 | 6.10 | 6.90 | 8.25 | 9.45 | 10.50 | 11.50 | 12.65 | |
| 17 5 | 5.25 | 6.00 | 6.50 | 7.28 | 8.78 | 10.05 | 11.25 | 12.40 | 13.65 | |
| | 5.55 | 6.38 | 7.00 | 7.65 | 9.30 | 10.65 | 12.00 | 13.25 | 14.50 | |
| 19 겉 | 5.80 | 6.75 | 7.50 | 8.25 | 10.13 | 11.25 | 12.90 | 14.20 | 15.60 | |
| 21 22 22 22 22 22 22 22 22 22 22 22 22 2 | 6.00 | 7.50 | 8.10 | 9.00 | 10.73 | 12.00 | 14.25 | 15.30 | 16.90 | |
| 23 25 25 21 x8 | 6.25 | 8.00 | 8.90 | 9.60 | 11.25 | 12.98 | 15.60 | 18.00 | 20.75 | |
| 22 22 | 6.50 | 8,55 | 9.50 | 10.28 | 12.00 | 14.10 | 16.80 | 19.30 | 22.20 | |
| 23 | 7.00 | 8.70 | 9.90 | 10.58 | 12.60 | 14.75 | 18.00 | 20.70 | 24.75 | |
| 24 | 7.50 | 8.90 | 10.00 | 10.95 | 13.20 | 15.68 | 19.05 | 22.80 | 27.30 | 32.75 |
| 26 | | * 9.55 | *10.50 | *11.95 | *14.40 | 17.10 | 21.30 | 26.25 | 31,20 | 37,50 |
| 28 | \ · · · · | *10.80 | *11.70 | *12.90 | *15.45 | 18.15 | 22.90 | 28.50 | 34.50 | 41.50 |
| 3 0 | <i>(</i> | *12.00 | *12 .90 | *14.10 | *17.25 | 19.90 | 24.75 | 31.50 | 38.10 | 45.75 |
| 32 | | 13.20 | 14.10 | 15.45 | 19.35 | 22.50 | 26.85 | 34,15 | 41.65 | 50.00 |
| 34 | | 14.40 | 15.75 | 17.25 | 21.75 | 25.50 | 30.00 | 36.75 | 45.00 | 54.00 |
| 36 | | 15.90 | 17.85 | 19.50 | 24.00 | 28.65 | 33.75 | 39.7 5 | 48.6 0 | 55.50 |
| 38 | | 19.50 | 20.65 | 21.75 | 26.4 0 | 31.05 | 37.15 | 42.75 | 51.75 | 58.85 |
| 40 | | 21.00 | 22.75 | 24.00 | 28.50 | 33.75 | 40.15 | 46.50 | 55.15 | 62.25 |
| 42 | | 23.25 | 24.85 | 26.25 | 32,25 | 37.50 | 43.50 | 50.25 | 57.75 | 65.65 |
| 44 | | | | 30.20 | 37.10 | 43.13 | 50.00 | 57.80 | 66.40 | 75.50 |
| 46 | | | | 34.70 | 42.63 | 49.60 | 57.50 | 66.35 | 76.35 | 86.85 |
| 48 | • • • • | | | 39.91 | 49.00 | 57.05 | 66.15 | 76.29 | 87.80 | 99.90 |
| 50 <u>.</u> g | | | | 45.45 | 55.95 | 63.45 | 76.45 | 84.75 | 100.65 | 109.35 |
| 52 | | | | 49.10 | 60.20 | 68.25 | 81.85 | 90.80 | 107.55 | 116.95 |
| 54 4 | | | | 52.70 | 64. 55 | 73.25 | 87.45 | 97.00 | 114.65 | 124.85 |
| 56 ø | | | | 55,70 | 67.65 | 76. 55 | 91.30 | 101.60 | 119.55 | 130.35 |
| 56 es Bore | • • • • | | | 58.55 | 70.75 | 79.90 | 95,15 | 106.10 | 124.70 | 135.85 |
| en I | | | | 61.60 | 73.80 | 83.30 | 99.00 | 110.60 | 129.30 | 141.35 |
| 62 | | | | | 84.80 | 94.95 | 112.20 | 123.85 | 145.45 | 158.00 |
| 64 💆 | | | | | 88.10 | 98.90 | 116.60 | 129.10 | 151.10 | 163.75 |
| 66 텵 | | | | | 91.45 | 102.85 | 121.00 | 133.90 | 156.80 | 169.95 |
| Standard 29 | | . : | | | 94.85 | 106.80 | 125.60 | 138.85 | 162.30 | 176.10 |
| 70 | | , | , | | 98.15 | 110.75 | 130.25 | 143.95 | 167.90 | 182.40 |
| 72 | | | ! | | 101.80 | 114.70 | 134.75 | 149.00 | 173.50 | 188.65 |
| 74 | | | | | 105.30 | 116.00 | 139.70 | 154.50 | 179.55 | 195.25 |
| 76 | | | | | 108.95 | 123.95 | 144.65 | 160.00 | 185.60 | 201.80 |
| 78 | • • • • | | • • • • • | • • • • • | 112.50 | 127.50 | 149.60 | 165.55 | 191.65 | 208.45 |
| 80 | | ļ | | | 116.55 | 131.85 | 154.35 | 171.00 | 197.95 | 215.40 |
| 82 | | | | | 120.50 | 136.25 | 159.10 | 176.55 | 204.20 | 220.00 |
| 84 | | | | | 124.55 | 140.65 | 163.90 | 182.15 | 210.55 | 229.35 |

^{*}Note.—Sizes marked thus *, add 10 per cent for 4 ; inch bore.

ONEIDA PRESSED STEEL SPLIT PULLEYS

| Diam- | | =1 | = - | | Width | OF FACE | , Inches | | | | |
|----------------------------|--|---|--|---|--|--|--|--|--|--|--|
| eter Inches | 20 | 22 | 24 | 26 | 23 | 30 | 32 | 34 | 36 | 38 | 40 |
| 24 26 28 | 37.00 42.00 46.00 | | | | | | | | | | |
| 30 32 34 36 38 | 50.00 54.50 59.00 62.00 65.50 | 58.00 65.00 75.00 85.00 95.00 | 65.00 80.00 90.00 100.00 112.00 | 75.00 90.00 100.00 110.00 120.00 | 85.00 96.00 110.00 118.00 128.00 | 95.00 110.00 118.00 124.00 140.00 | 115,00 125,00 133,00 150,00 | 140.00 160.00 | | | |
| 40 | 69.50 | 105.00 | 120.00 | 130.00 | 137.00 | 148.00 | 160,00 | 170.00 | 175.00 | 184,00 | 195.00 |
| 42 | 74.50 | 115.00 | 127.00 | 138.00 | 145.00 | 155.00 | 170,00 | 180.00 | 187.00 | 192,00 | 203.00 |
| 44 | 85.00 | 120.00 | 135.00 | 143.00 | 154.00 | 163.00 | 180,00 | 189.30 | 197.50 | 203,60 | 212.30 |
| 46 | 97.00 | 128.00 | 141.00 | 151.00 | 163.20 | 175.00 | 188,80 | 198.20 | 205.40 | 214,15 | 222.00 |
| 48 | 113.00 | 138.00 | 150.00 | 160.00 | 171.80 | 183.40 | 199,00 | 208.00 | 220.60 | 234,00 | 248.00 |
| 50 | 131.75 | 152.25 | 162.10 | 172.00 | 182.65 | 193.10 | 217.70 | 228.30 | 238.85 | 249.50 | 260.25 |
| 52 | 141.25 | 162.30 | 173.45 | 184.60 | 195.80 | 207.15 | 233.00 | 244.55 | 255.95 | 267.55 | 279.20 |
| 54 | 151.00 | 173.30 | 185.30 | 197.35 | 209.50 | 221.75 | 248.85 | 261.15 | 273.50 | 285.95 | 299.60 |
| 56 | 159.20 | 181.10 | 193.70 | 206.50 | 219.10 | 232.10 | 259.85 | 272.80 | 286.00 | 299.00 | 312.40 |
| 58 | 165.20 | 188.80 | 202.00 | 215.55 | 228.85 | 242.50 | 270.85 | 284.20 | 297.55 | 311.25 | 324.75 |
| 60 | 172.25 | 196.60 | 210.65 | $\begin{array}{c} 224.70 \\ 248.40 \\ 258.55 \\ 268.00 \\ 278.00 \end{array}$ | 238.80 | 252.90 | 281.80 | 295.90 | 310.00 | 324.00 | 338.15 |
| 62 | 190.75 | 218.45 | 233.20 | | 263.55 | 278.75 | 311.50 | 326.80 | 341.90 | 357.00 | 371.15 |
| 64 | 198.20 | 227.75 | 243.70 | | 274.00 | 289.50 | 321.45 | 337.95 | 353.50 | 368.80 | 384.20 |
| 66 | 205.75 | 235.95 | 252.00 | | 284.25 | 300.35 | 334.20 | 350.35 | 366.50 | 382.75 | 398.90 |
| 68 | 213.50 | 244.45 | 261.50 | | 294.85 | 311.60 | 346.15 | 363.00 | 379.85 | 396.75 | 413.60 |
| 70 72 74 76 78 | 221,35 229,00 237,20 245,55 253,95 | $\begin{array}{c} 253.00 \\ 261.50 \\ 270.40 \\ 279.25 \\ 288.20 \end{array}$ | 270.60 280.95 289.35 298.85 308.50 | $\begin{array}{c} 288.00 \\ 298.00 \\ 308.10 \\ 318.20 \\ 328.50 \end{array}$ | 305,50 316,20 326,95 337,85 348,75 | 323,00 334,40 345,90 357,40 369,00 | 358.15 370.20 382.35 394.65 406.90 | 375,65 388,40 401,35 414,20 427,15 | 393.15 406.60 420.15 433.70 447.35 | 410.35 424.85 439.00 453.20 467.60 | 428.25 443.10 457.90 473.00 487.85 |
| 80 | 262.50 | 297.45 | 318.45 | 339,00 | 360.00 | 380,85 | 419.55 | 440,35 | 461.40 | 482.40 | 503.30 |
| 82 | 271.15 | 306.80 | 328,55 | 349,65 | 371.25 | 392,80 | 432.20 | 453,80 | 475.40 | 497.20 | 518.80 |
| 84 | 279.80 | 316.00 | 338.00 | 360,25 | 382.50 | 404,85 | 444.85 | 467,20 | 489.60 | 513.30 | 536.35 |
| 86 | 308.00 | 348.00 | 372.00 | 395,30 | 418.40 | 441,40 | 486.50 | 509,50 | 532.50 | 556.40 | 579.80 |
| 88 | 316.15 | 358.00 | 382.40 | 406,00 | 430.00 | 453,80 | 500.00 | 523,30 | 547.80 | 570.00 | 596.00 |
| 90 | 325,30 | 367,95 | 392.50 | 417.20 | 441.70 | 466.50 | 513.20 | 537.90 | 562.60 | 587.20 | 611.90 |
| 92 | 334,70 | 378,30 | 403.80 | 429.00 | 454.30 | 479.85 | 527.70 | 552.80 | 578.20 | 603.65 | 629.00 |
| 94 | 344,20 | 388,60 | 414.90 | 440.80 | 466.78 | 493.15 | 533.40 | 564.65 | 593.85 | 620.00 | 646.25 |
| 96 | 353,60 | 403,90 | 426.10 | 452.70 | 479.20 | 506.45 | 555.75 | 582.60 | 609.55 | 636.50 | 663.45 |
| 98 | 367,00 | 413,00 | 437.00 | 464.40 | 491.90 | 519.35 | 569.50 | 597.25 | 625.00 | 652.25 | 680.30 |
| 100 | 374.90 | 421.50 | 449.00 | 477.40 | 505.10 | 533.85 | 583,45 | 611.90 | 640.45 | 668.90 | 697.30 |
| 102 | 383.00 | 429.90 | 459.00 | 488.00 | 517.15 | 546.20 | 597,40 | 626.55 | 655.85 | 685.00 | 714.25 |
| 104 | 393.00 | 440.70 | 470.40 | 500.00 | 529.70 | 559.40 | 611,20 | 641.10 | 671.00 | 700.80 | 730.70 |
| 106 | 403.20 | 451.50 | 481.80 | 511.90 | 542.30 | 572.65 | 625,25 | 655.70 | 686.25 | 716.65 | 747.15 |
| 108 | 413.30 | 462.25 | 493.20 | 524.00 | 554.90 | 585.95 | 639,15 | 670.30 | 701.40 | 732.50 | 763.60 |
| 110 | 422.00 | 472. 94 | 504.55 | 536,15 | 571.55 | 599.80 | 653.90 | 685,90 | 717.85 | 749.75 | 781.75 |
| 112 | 432.50 | 483. 65 | 515.95 | 548,35 | 588.30 | 613.70 | 668.60 | 701,50 | 734.30 | 767.00 | 799.90 |

For odd size in diameter, Pulleys above 24-inch, add 10 per cent to next higher list. 20 to 24 inch, 47% bore, 2.00 net extra per hub. Sizes marked thus*, add 10 % to list, 20 to 60 inch, 6½-inch bores, 2.00 net extra per hub; 8½ bore 3.00 net extra per hub.



DODGE CAST IRON SOLID AND SPLIT PULLEYS

MACHINE MOULDED

SOLID SINGLE ARM PULLEY



SPLIT SINGLE ARM PULLEY



Fig. 9113B

SOLID DOUBLE ARM PULLEY



Fig. 9113C

In ordering state if set screw or key way is wanted; if both, whether set screws are to be on key. When key ways are wanted, specify whether Standard, Flator Taper.

Driving Pulleys for shifting belt should have straight face and for non-shifting belt, crown face. Tight and loose pulleys should have crown face. Hubs of tight and loose pulleys are faced and loose pulley bores are reamed.

STANDARD BORES FOR REGULAR TYPE SOLID AND SPLIT IRON PULLEYS

| Diameter of Pulleyinches Bore | | | | 21 to 30 | 31 to 42 41/2 |
|-------------------------------|----------|----------|----------|----------|------------------|
| Diameter of Pulley inches | 43 to 54 | 55 to 66 | 67 to 78 | 79 to 90 | 91 to 96 |
| | 5 | 6 | 7 | 8 | 9 |

DODGE SOLID IRON PULLEYS, SINGLE BELT

BORED, TURNED AND BALANCED WITH SET SCREWS OR KEY SEATS

| | | | | | | | | | - | |
|-----------------|-------------|-------|----------------|--------|---------|----------|-------|---------------------------------------|---------------|-----------------|
| 1) lo | | | | w | IDTH OF | FACE, IN | CHES | | | |
| Diam. Inches | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 6 | 2.20 | 2.50 | 2.85 | 3.20 | 3.60 | 4.05 | | · · · · · · · · · · · · · · · · · · · | | |
| 7 | 2.40 | 2.75 | 3.10 | 3.50 | 3.95 | 4.40 | | | | ! |
| 8 | 2.65 | 3.00 | 3.40 | 3.80 | 4.25 | 4.75 | 1 | | | |
| 9 | 2.90 | 3.25 | 3.65 | `4.10 | 4.60 | 5.10 | | | | |
| 10 | 3.10 | 3.50 | 3.95 | 4.40 | 4.90 | 5,45 | | | | |
| 11 | 3.30 | 3.75 | 4.20 | 4.70 | 5.25 | 5.85 | | | | · |
| 12 | 3.60 | 4.05 | 4.55 | 5.10 | 5.70 | 6.30 | | | | |
| 13 | 3.65 | 4.35 | 4.90 | 5.50 | 6.10 | 6.75 | 7.45 | | | |
| 14 | 4.05 | 4.65 | 5.10 | 5.75 | 6.45 | 7.20 | 7.95 | | | · · · · · · · · |
| 15 | 4.35 | 4.85 | 5.65 | 6.10 | 6.85 | 7.70 | 8.60 | | | |
| 16 | 4.65 | 5.20 | 5.80 | 6.50 | 7.30 | 8.20 | 9.20 | | | |
| 17 | 4.90 | 5.55 | 6.25 | 7.00 | 7.85 | 8.75 | 9.75 | | | |
| 18 | 5.20 | 5.85 | 6.60 | 7.40 | 8.30 | 9.30 | 10.40 | | · | |
| 19 | 5.45 | 6.25 | 7.05 | 7.90 | 8.85 | 9.85 | 10.95 | | | |
| 20 | 5.75 | 6.65 | 7.55 | 8.50 | 9.45 | 10.45 | 11.55 | 12.70 | | |
| 21 | 6.05 | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 12.10 | 13.25 | | |
| 22 | 6.35 | 7.40 | 8.45 | 9.50 | 10.55 | 11.55 | 12.65 | 13.85 | , | ' . |
| 23 | 6.70 | 7.80 | 8.90 | 10.00 | 11.10 | 12.15 | 13.30 | 14.45 | | |
| 24 | 7.05 | 8.20 | 9.35 | 10.50 | 11.65 | 12.80 | 14.00 | 15.20 | | |
| 25 | 7.40 | 8.60 | 9.80 | 11.00 | 12.20 | 13.40 | 14.65 | 15.90 | | |
| 26 | 7.75 | 9.00 | 10.25 | 11.50 | 12.75 | 14.05 | 15.35 | 16.70 | | |
| 27 | 8.15 | 9.50 | 10.80 | 12.10 | 13.45 | 14.80 | 16.20 | 17.65 | 19.15 | |
| 28 | 8.55 | 9.95 | 11.35 | 12.75 | 14.15 | 15.55 | 17.00 | 18.50 | 20.10 | |
| 29 | 9.00 | 10.50 | 12.00 | 13.45 | 14.90 | 16.35 | 17.95 | 19.45 | 21.05 | · · · · • • |
| 30 | 9.40 | 10.90 | 12.45 | 14.00 | 15.85 | 17.15 | 18.75 | 20.35 | 22.00 | |
| 31 | 9.85 | 11.40 | 12.95 | 14.55 | 16.15 | 17.80 | 19.50 | 21.25 | 23 .00 | |
| 32 | 10.30 | 11.90 | 13.55 | 15.20 | 16.90 | 18.60 | 20.35 | 22.15 | 24.00 | |
| 33 | 10.80 | 12.40 | 14.10 | 15.85 | 17.65 | 19,45 | 21.30 | 23.15 | 25.05 | |
| 34 | 11.35 | 12.95 | 14.70 | 16.50 | 18.40 | 20.30 | 22.20 | 24.15 | 26.10 | • • • • • |
| 35 | 11.85 | 13.50 | 15. 3 0 | 17, 15 | 19.10 | 21.20 | 23.10 | 2 5.15 | 27.2 0 | |
| 36 | 12.40 | 14.20 | 16.05 | 18.00 | 20.05 | 22.10 | 24.15 | 26, 20 | 28.30 | 30.45 |
| 38 | | 15.65 | 17.70 | 19.80 | 21.95 | 24.10 | 26.25 | 28.40 | 30.60 | 32.85 |
| 40 | | 16.75 | 18.95 | 21.15 | 23.40 | 25.70 | 28.00 | 30.30 | 32.60 | 34.95 |
| 42 | | 17.90 | 20.20 | 22.60 | 25.00 | 27.40 | 29.80 | 32.20 | 34.65 | 37.10 |
| 44 | • • • • • • | 19.30 | 21.75 | 24.20 | 26.70 | 29.25 | 31.80 | 34.30 | 36,80 | 39.30 |
| 46 | | 20.80 | 23.35 | 25.95 | 28.55 | 31.20 | 33.85 | 36.50 | 39.15 | 41.60 |
| 48 | <u></u> | 22.40 | 25.05 | 27.75 | 30.45 | 33.20 | 35.95 | 38.75 | 41.60 | 43.90 |



DODGE SOLID IRON PULLEYS, DOUBLE BELT BORED, TURNED AND BALANCED, WITH SET SCREWS OR KEY-SEATS

| | | | | Wı | отн ог І | ACE, INC | нев | | | |
|--------------------|----------------|---------------------|---|-----------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|------------------|
| Diameter Inches | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 6 | 2.50 | 2.80 | 3.15 | 3.60 | 4.10 | 4.55 | 5.05 | 5.55 | 6.05 | 6.55 |
| 7 | 2.70 | 3.05 | 3.50 | 3.95 | 4.40 | 4.90 | 5.35 | 5.85 | 6.35 | 6.85 |
| 8 | 2.90 | 3.35 | 3.80 | 4.25 | 4.75 | 5.25 | 5.80 | 6.35 | 6.95 | 7.60 |
| 9 | 3.20 | 3.65 | 4.15 | 4.65 | 5.20 | 5.75 | 6.30 | 6.90 | 7.50 | 8.15 |
| 10 11 | 3.45 3.70 | $\frac{3.95}{4.25}$ | 4.45 4.80 | $\frac{5.00}{5.40}$ | 5.55 | 6.15 6.65 | 6.80 7.30 | 7.50 8.00 | 8.20 8.75 | 8.95 9.55 |
| 12 | 3.95 | 4.55 | 5.15 | 5.80 | $\frac{6.00}{6.45}$ | 7.15 | 7.85 | 8.60 | 9.35 | 10.15 |
| 13 | 4.20 | 4.85 | 5.50 | 6.20 | 6.90 | 7.65 | 8.40 | 9.20 | 10.00 | 10.15 |
| 14 | 4.50 | 5.20 | 5.95 | 6.70 | 7.50 | 8.30 | 9.10 | 9.95 | 10.80 | 11.70 |
| 15 | 4.80 | 5.55 | 6.35 | 7.15 | 8.00 | 8.85 | 9.75 | 10.65 | 11.60 | 12.55 |
| 16 | 5.10 | 5.80 | 6.60 | 7.45 | 8.50 | 9.20 | 10 .10 | 11.05 | 12.00 | 13.00 |
| 17 | 5.40 | 6.25 | 7.10 | 8.00 | 8.90 | 9.85 | 10.80 | 11.80 | 12.80 | 13.85 |
| 18 | 5.70 | 6.65 | 7.60 | 8.55 | 9.55 | 10.55 | 11.60 | 12.65 | 13.75 | 14.85 |
| 19 2 0 | 6.05 | 7.05 7.45 | 8.10 | 9.15 | 10.25 | 11.35 | 12 40 | 13.55 | 14.70 | 15.90 |
| $\frac{20}{21}$ | 6.75 | 7.45 | $\begin{array}{c} 8.55 \\ 9.00 \end{array}$ | $9.65 \\ 10.15$ | $10.80 \\ 11.35$ | $11.95 \\ 12.55$ | 13.15 13.80 | $14.35 \\ 15.05$ | $15.60 \\ 16.35$ | 16.85 17.65 |
| $\frac{21}{22}$ | 7.10 | 8.30 | 9.50 | 10.75 | 12.00 | 13.30 | 14.60 | 15.95 | 17.30 | 18.70 |
| $\frac{23}{23}$ | 7.50 | 8.75 | 10.05 | 11.35 | 12.70 | 14.05 | 15.45 | 16.85 | 18.30 | 19.75 |
| 24 | 7.90 | 9.25 | 10.60 | 12.00 | 13.40 | 14.85 | 16.30 | 17.80 | 19.30 | 20.85 |
| 25 | 8.35 | 9.75 | 11.20 | 12.65 | 14.15 | 15.6 5 | 17.20 | 18.75 | 20.35 | 21.95 |
| 26 | 8.80 | 10.30 | 11.80 | 13.35 | 14.90 | 16.50 | 18.10 | 19.75 | 21.40 | 23.10 |
| 27 | 9.30 | 10.85 | 12.45 | 14.05 | 15.70 | 17.35 | 19.05 | 20.75 | 22.50 | 24.25 |
| 28 | 9.80 | 11.45 | 13.10 | 14.80 | 16.50 | 18.25 | 20.00 | 21.80 | 23.60 | 25.45 |
| 29 30 | 10.30 10.85 | $12.00 \\ 12.65$ | $13.75 \\ 14.45$ | $15.50 \\ 16.30$ | $17.30 \\ 18.15$ | $\frac{19.10}{20.05}$ | $20.95 \\ 21.95$ | $22.80 \\ 23.90$ | 24.70 25.85 | $26.60 \\ 27.85$ |
| 30 31 | 11.40 | 13.25 | 15.15 | 17.05 | 19.00 | 20.05 | $\frac{21.95}{22.95}$ | 24.95 | 27.00 | 29.05 |
| 32 | 11.95 | 13.90 | 15.85 | 17.85 | 19.85 | 21.90 | 23.95 | 26.05 | 28.15 | 30.30 |
| 33 | 12.50 | 14.50 | 16.55 | 18.60 | 20.70 | 22.80 | 24.95 | 27.10 | 29.30 | 31.55 |
| 34 | 13.10 | 15.20 | 17.30 | 19.45 | 21.60 | 23.80 | 26.05 | 28.30 | 30.60 | 32.90 |
| 35 | 13.70 | 15.90 | 18.10 | 20.35 | 22.60 | 24.90 | 27.20 | 29.55 | 31.90 | 34.30 |
| 36 | 14.30 | 16.55 | 18.85 | 21.15 | $\frac{23.50}{2}$ | 25.85 | 28.25 | 30.70 | 33.15 | 35.65 |
| 38 40 | | $18.00 \\ 19.50$ | $20.50 \\ 22.15$ | $23.00 \\ 24.80$ | $25.55 \\ 27.45$ | $28.10 \\ 30.10$ | $30.70 \\ 32.80$ | 33.30 35.50 | $35.95 \\ 38.20$ | 38.60 40.95 |
| 42 | | 21.05 | $\frac{22.15}{23.85}$ | 26.65 | $\frac{21.45}{29.45}$ | 32.25 | 35.10 | 37.95 | 40.80 | 43.70 |
| 44 | | 22.65 | 25.65 | 28.65 | 31.65 | 34.65 | 37.70 | 40.75 | 43.80 | 46.85 |
| 46 | | 24.35 | 27.50 | 30.65 | 33.85 | 37.05 | 40.25 | 43.45 | 46.70 | 49.95 |
| 48 | [. | 26.10 | 29.40 | 32.75 | 36.10 | 39.45 | 42.85 | 46.25 | 49.65 | 53.10 |
| 50 | 1 | 27.90 | 31.40 | 34.90 | 38.40 | 41.95 | 45.50 | 49.10 | 52.70 | 56.35 |
| 52 | · · · · · · i | 29.80 | 33.50 | 37.25 | 41.00 | 44.75 | 48.55 | 52.35 | 56.20 | 60.05 |
| 54 5e | l | 31.75 | 35.65 | 39.60 | 43.55 | 47.55 | 51.55 | 55.60 | 59.65 | 63.75 |
| 56 58 | | 33.80 35.95 | $37.90 \\ 40.25$ | $\frac{42.05}{44.60}$ | $\frac{46.20}{49.00}$ | 50.40 53.45 | $54.65 \\ 57.95$ | $58.95 \\ 62.45$ | $63.25 \\ 67.00$ | $67.50 \\ 71.55$ |
| 60 | | 38.20 | 42.65 | 47.25 | 51.85 | 56.50 | 61.20 | 65.90 | 70.65 | 75.45 |
| 62 | | 40.50 | 45.15 | 49.85 | 54.60 | 59.40 | 64.25 | 69.15 | 74.10 | 79.10 |
| 64 | | | | 52.65 | 57.50 | 62.40 | 67.35 | 72.35 | 77.40 | 82.50 |
| 66 | | . | | 55.55 | 60.50 | 65.50 | 70.55 | 75.65 | 80.80 | 86.00 |
| 68 | | | | 58.55 | 63.60 | 68.70 | 73.85 | 79.05 | 84.30 | 89.60 |
| 70 70 | | | , | $\frac{61.50}{24.55}$ | 66.70 | 71.95 | 77.85 | 82.65 | 88.10 | 93.60 |
| 72 71 | | · · · · · · · . | | 64.55 | 69.90 | 75.30 | 80.75 | 86.25 | 91.80 | 97.40 |
| 74 76 | · · · · · · | • • • • • • | • • • • • • • | • • • • • • • | | $78.75 \\ 82.30$ | 84.35 88.05 | 90.05 93.90 | 95.80 | 101.60 105.90 |
| 78 | | ' | | • • • • • • • | | 85.95 | 91.90 | 97.95 | 104.10 | |
| 84 | | | | | | 97.50 | 104.20 | 111.00 | | |
| | | | | | | 00 | | | -100 | |

DODGE

SPLIT IRON PULLEYS, SINGLE BELT

BORED, TURNED AND BALANCED WITH SET SCREWS AND KEY SEATS

| Diameter. | | | | w | IDTH OF | FACE, I | NCHES | | | |
|--------------------|----------------|---------------|----------------|-----------------------|-----------------------|----------------|-----------------------|-----------------------|-----------|-----------|
| Inches | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 |
| 6 | 3.70 | 4.00 | 4.60 | 4.95 | 5.60 | 6.05 | | | •••• | |
| 7 | 3.90 | 4.25 | 4.85 | 5.25 | 5.95 | 6.40 | • • • • | | | • • • • • |
| 8 | 4.25 | 4.60 | 5.30 | 5.70 | 6.45 | 6.95 | | | • • • • • | • • • • • |
| 9 | 4.50 | 4.85 | 5.55 | 6.00 | 6.80 | 7.30 | • • • • • | | | • • • • • |
| 10 | 4.80 | 5.20 | 6.00 | 6.45 | 7.30 | 7.85 | • • • • • | | • • • • • | •••• |
| 11 | 5.00 | 5.45 | 6.25 | 6.75 | 7.65 | 8.25 | | | | |
| 12 | 5.40 | 5.85 | 6.75 | 7.30 | 8.30 | 8.90 | | | | • • • • • |
| 13 | 5.45 | 6.15 | 7.10 | 7.70 | 8.70 | 9.35 | 10.50 | | • • • • • | • • • • • |
| 14 | 6.00 | 6.60 | 7.50 | 8.15 | 9.30 | 9.95 | 11.30 | | • • • • • | •••• |
| 15 | 6.30 | 6.80 | 8.05 | 8.50 | 9.70 | 10.55 | 11.95 | | •••• | • • • • • |
| 16 | 6.75 | 7.30 | 8.40 | 9.10 | 10.40 | 11.30 | 12.85 | | | • • • • |
| 17 | 7.00 | 7.60 | 8.85 | 9.60 | 10.95 | 11.95 | 13.40 | | | • • • • • |
| 18 | 7.45 | 8.05 | 9.40 | 10.20 | 11.70 | 12.65 | 14.35 | | • • • • • | •••• |
| 19 | 7.70 | 8.50 | 9.85 | 10.70 | 12.20 | 13.20 | 14.90 | 17.00 | | •••• |
| 20 21 | 8.20 | 9.10 | 10.60 11.05 | $11.55 \\ 12.05$ | 13.10 13.65 | 14.10 14.65 | 15.85 16.40 | 17.00 17.55 | • • • • • | •••• |
| $\frac{21}{22}$ | 8.50 | 9.45 10.05 | 11.75 | 12.80 | 14.50 | 15.50 | 17.30 | 18.50 | •••• | • • • • • |
| 22 23 | $9.00 \\ 9.35$ | 10.05 | 12.20 | $\frac{12.80}{13.30}$ | 15.05 | 16.10 | 17.95 | 19.10 | | • • • • • |
| $\frac{25}{24}$ | 9.85 | 11.00 | 12.20 | 14.05 | 15.90 | 17.05 | 19.00 | 20.20 | •••• | • • • • • |
| 25 25 | 10.20 | 11.40 | 13.35 | 14.55 | 16.45 | 17.65 | 19.65 | 20.20 | | • • • • • |
| 26 26 | 10.20 | 12.00 | 14.10 | 15.35 | 17.35 | 18.65 | $\frac{13.05}{20.75}$ | $\frac{20.50}{22.10}$ | | •••• |
| 20 27 | 11.15 | 12.50 12.50 | 14.65 | 15.95 | 18.05 | 19.40 | 21.60 | 23.05 | 25.35 | |
| 28 | 11.80 | 13.20 | 15,50 | 16.90 | 19.10 | 20.50 | 22.80 | 24.30 | 26.75 | ••••• |
| 29 29 | 12.25 | 13.75 | 16.15 | 17.60 | 19.85 | 21.30 | 24.75 | 25.25 | 27.70 | ••••• |
| 30 | 12.90 | 14.40 | 16.90 | 18.45 | 21.15 | 22.45 | 24.95 | 26.55 | 29.10 | •••• |
| 31 | 13.35 | 14.90 | 17,40 | 19.00 | 21.45 | 23.10 | 25.70 | 27.45 | 30.10 | •••• |
| 32 | 14.10 | 15.70 | 18.35 | 20.00 | $\frac{21.40}{22.60}$ | 24.30 | 27.00 | 28.80 | 31.60 | ••••• |
| 33 | 14.60 | 16.20 | 18.90 | 20.65 | 23.25 | 26.10 | 27.95 | 29.80 | 32.65 | •••• |
| 34 | 15.45 | 17.05 | 19.85 | 21.65 | 24.50 | 26.40 | 29.30 | 31.25 | 34.20 | •••• |
| 35 | 15.95 | 17.60 | 20.45 | $\frac{21.00}{22.30}$ | 25.20 | 27.30 | 30.20 | 32.25 | 35.30 | ••••• |
| 36 | 16.80 | 18.60 | 21.55 | 23.50 | 26.55 | 28.60 | 31.70 | 33.75 | 36.90 | 39.05 |
| 38 | 10.00 | 20.40 | 23.65 | 25.70 | 28.90 | 31.05 | 34.30 | 36.45 | 39.75 | 42.00 |
| 40 | ::::: | 21.85 | 25.25 | 27.45 | 30.80 | 33.10 | 36.55 | 38.85 | 42.30 | 44.65 |
| $\overset{40}{42}$ | | 23.35 | 26 .90 | 29.30 | 32.85 | 35.25 | 38.85 | 41.25 | 44.90 | 47.35 |
| 44 | | 25.35 | 28.30 | 31.35 | 35.05 | 37.60 | 41.40 | 43.90 | 47.65 | 50.15 |
| 46 | | 27.05 | 3 0,95 | 33.55 | 37.40 | 40.05 | 44.00 | 46.65 | 50.60 | 53.05 |
| 48 | | 29.05 | 33, 10 | 35,80 | 39.80 | 42.55 | 46.65 | 49.45 | 53.65 | 55.95 |

Prices on larger diameters will be furnished upon receipt of inquiry.

No pulleys will be made single belt with bores larger than standard limits.

For tight and loose pulleys see additional list.

For flange pulleys see additional list.

Additional charge is made if bore is larger than standard.

For list of clamp hub pulleys (split hub, solid rim), add one-half the difference between the lists of solid and split pulleys to that of the solid pulleys.



WHEN ORDERING BY FIGURE NUMBER, PLEASE GIVE THE PAGE NUMBER ALSO.

DODGE SPLIT IRON PULLEYS, DOUBLE BELT BORED, TURNED AND BALANCED WITH SET SCREWS OR KEY SEATS

| | , | | | Win | TH OF B | ACE. INC | 7000 | | | |
|---|----------------|----------------|-----------------------|------------------|-------------------|------------------|-----------------|----------------|------------------|---|
| Diameter. Inches | 3 | 4 | 5 | | | | | 10 | 1 10 | 1 14 |
| | | | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 |
| 6 7 | 4.00 | 4.30 4.55 | 4.90 5.25 | 5.35 5.70 | 6.10 6.40 | 6.55 | 7.35 | 7.85 8.15 | 9.15 | • |
| 8 | 4.50 | 4.95 | 5.70 | 6.15 | 6.95 | 6.90 7.45 | 8.35 | 8.90 | 9.50 10.50 | |
| 9 | 4.80 | 5.25 | 6.05 | 6.55 | 7.40 | 7.95 | 8.85 | 9.45 | 11.05 | |
| 10 | 5.15 | 5.65 | 6.50 | 7.05 | 7.95 | 8.55 | 9.60 | 10.30 | 12.15 | ::::::: |
| 11 | 5.40 | 5.95 | 6.85 | 7.65 | 8.40 | 9.05 | 16.10 | 10.80 | 12.75 | |
| 12 | 5.75 | 6.40 | 7.35 | 8.00 | 9.05 | 9.75 | 10.90 | 11.65 | 13.65 | 15.75 |
| 13 | 6.00 | 6.65 | 7.70 | 8.40 | 9.50 | 10.25 | 11.45 | 12.25 | 14.35 | 16.60 |
| 14 | 6.45 | 7.15 | 8.35 | 9.10 | 10.35 | 11.15 | 12.45 | 13.30 | 15.55 | 17.90 |
| 15 | 6.75 | 7.50 | 8.75 | 9.55 | 10.85 | 11.70 | 13.10 | 14.00 | 16.40 | 18.90 |
| 16 | 7.20 | 7.90 | 9.20 | 10.05 | 11.60 | 12.30 | 13.75 | 14.70 | 17.20 | 19.80 |
| 17 18 | 7.50 | 8.35 | 9.70 | 10.60 | 12.00 | 12.95 | 14.45 | 15.50 | 18.05 | 20.80 |
| 19 | 7.95 8.30 | 8.90 9.30 | 10.40 10.95 | 11.35 11.95 | 12.90 13.60 | 13.90 14.70 | 15.55 | 16.60 17.50 | 19.40 | 22.25 23.55 |
| 20 | 8.85 | 9.90 | 11.60 | 12.70 | 14.45 | 15.60 | 16.35 17.45 | 18.65 | 20.45 | 25.10 |
| $\frac{20}{22}$ | 9.75 | 10.95 | 12.80 | 14.05 | 15.95 | 17.25 | 19.25 | 20.60 | 24.05 | 27.65 |
| $\frac{22}{24}$ | 10.70 | 12.05 | 14.15 | 15.55 | 17.65 | 19.10 | 21.30 | 22.80 | 26.60 | 30.55 |
| 25 | 11.15 | 12.55 | 14.75 | 16.20 | 18.40 | 19.90 | 22.20 | 23.75 | 27.70 | 31.80 |
| 26 | 11.80 | 13.30 | 15.65 | 17.20 | 19.50 | 21.10 | 23.50 | 25.15 | 29.30 | 33.60 |
| 27 | 12.30 | 13.85 | 16.30 | 17.90 | 20.30 | 21.95 | 24.45 | 26.15 | 30.45 | 34.90 |
| 28 | 13.05 | 14.65 | 17.25 | 18.95 | 21.45 | 23.20 | 25.80 | 27.60 | 32.10 | 36.75 |
| 29 | 13.55 | 15.25 | 17.90 | 19.65 | 22.25 | 24.05 | 26.75 | 28.60 | 33.25 | 38.05 |
| 30 | 14.35 | 16.15 | 18.90 | 20.75 | 23.45 | 25.35 | 28.15 | 30.10 | 34.95 | 39.95 |
| 31 | 14.90 | 16.75 | 19.60 | 21.50 | 24.30 | 26.25 | 29.15 | 31.15 | 36.15 | 41.30 |
| 32 33 | 15.75 | 17.70 | $20.65 \\ 21.35$ | $22.65 \\ 23.40$ | $25.55 \\ 26.30$ | 27.60 | 30.60 | 32.70 | 37.90 39.20 | 43.30 44.70 |
| 34 | 16.30 17.20 | 18.30 19.30 | $\frac{21.35}{22.45}$ | 21.60 | $26.30 \\ 27.70$ | 29.45 29.90 | 31.60 | 33.75 35.40 | 41.00 | 46.75 |
| 35 | 17.80 | 20.00 | 23.25 | 25.50 | $\frac{2}{28.70}$ | 31.00 | 34.30 | 36.65 | 42.40 | 48.30 |
| $\widetilde{36}$ | 18.70 | 20.95 | 24.40 | 26.65 | 30.00 | 32.35 | 35.80 | 38.25 | 44.25 | 50.40 |
| 38 | | 22.75 | 26.45 | 28.90 | 32.50 | 35.05 | 38.75 | 41.35 | 47.75 | 54.30 |
| 40 | | 24.60 | 28.45 | 31.10 | 34.85 | 37.50 | 41.35 | 44.05 | 50.65 | 57.35 |
| 42 | | 26.50 | 30.55 | 33.35 | 37.30 | 40.10 | 44.15 | 47.00 | 53.95 | 60.70 |
| 44 | | 28.50 | 32.80 | 35.80 | 40.00 | 43.00 | 47.30 | 50.3 0 | 57.70 | 64.90 |
| 46 | | 30.60 | 35.10 | 38.25 | 42.70 | 45.90 | 50.40 | 53.60 | 61.40 | 69.00 |
| 48 | | 32.75 | 37.45 | 40.80 | 45.45 | 48.80 | 53.55 | 57.95 | 65.15 | 73.15 |
| 50 52 | | 35.00 37.35 | $39.95 \\ 42.55$ | 43.45 46.30 | 48.30 | 51.85 55.20 | 56.80 | 60.40 | 69.05 | 77.55 82.40 |
| 5 <u>4</u> | | 39.75 | 45.20 | 49.15 | $51.45 \\ 54.55$ | 58.55 | 60.45 | 64.25 68.10 | 73.40 77.75 | 87.25 |
| 56 | | 42.30 | 48.00 | 52.15 | 57.80 | 62.00 | 67.80 | 72.10 | 82.20 | 92.25 |
| 58 | | 44.95 | 50.90 | 55.25 | 61.20 | 65.65 | 71.75 | 76.25 | 86.95 | 97.50 |
| 60 | | 47.70 | 53.85 | 58.45 | 64.65 | 69.30 | 75.65 | 80.35 | 91.55 | 102.65 |
| 62 | | 50.55 | 56.95 | 61.65 | 68.05 | 72.85 | 79.40 | 84.30 | 95.95 | 107.55 |
| 64 | | | · • • • • • • | 65.05 | 71.60 | 76.50 | 83.20 | 88.20 | 100.10 | 111.95 |
| 66 | ' | | . | 68.55 | 75.25 | 80.25 | 87.10 | | 104.35 | 116.45 |
| 68 | | | | 72.20 | 79.05 | 84.15 | 91.15 | | 108.75 | 121.10 |
| 70 70 | | | · • • • • • • | 75.80 | 82.85 | 88.10 | 95.30 | | 113.55 | 126.35 |
| $\begin{array}{c} 72 \\ 74 \end{array}$ | | | | | 86.75 | $92.15 \\ 96.35$ | 99.55 | | 118.15 123.20 | 131.30 136.85 |
| 76 | | | | | | 100.65 | 103.95 108.45 | | 128.35 | $130.55 \\ 142.55$ |
| 78 | | | | | | | 113.10 | | 133.70 | 142.55 148.45 |
| F4 | | | | · · · · · · · · | | | 127.95 | | 150.95 | 167.40 |
| 90 | | | | | | 134.00 | 144.00 | | 169.85 | 188.20 |
| 96 | | | | l | | 150.05 | 161.35 | | 190.55 | 210.95 |
| 102 | | ! | | | · • • • • • • ! | 164.55 | 176.80 | | 208.45 | 230.50 |
| 108 | | | | | | 180.20 | 193.20 | | 226.90 | 250.45 |
| 120 | | | | | | 218.85 | 233.60 | 245.25 | 271.95 | 298.70 |
| | | | | | | | | | | |

DODGE SPLIT IRON PULLEYS, DOUBLE BELT

BORED, TURNED AND BALANCED WITH SET SCREWS OR KEY SEATS

| | | | | $W_{\rm 1DTH}$ | OF FACE, | INCHES | | | |
|--------------------|--------|--------|--------|----------------|----------|--------------------|-----------------|--------|-----------------|
| Diameter Inches | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 18 | 25.30 | 27.25 | | | | | | | |
| 19 | 26.75 | 28.75 | 30.10 | 32.15 | | | | | |
| 20 | 28.50 | 30.65 | 32.05 | 34.25 | | | | | |
| 21 | 29.50 | 31.70 | 33.15 | 35.40 | | | | | |
| 22 | 31.35 | 33.65 | 35.20 | 37.55 | 39.15 | 41.65 | | | |
| 23 | 32.70 | 35.10 | 36.70 | 39.15 | 40.80 | 43.35 | | | |
| 24 | 34.60 | 37.10 | 38.80 | 41.35 | 43.10 | 45.75 | | | |
| 25 | 36.00 | 38.60 | 40.35 | 43.00 | 44.80 | 47.55 | 49.40 | | |
| 26 | 38.00 | 40.70 | 42.55 | 45.30 | 47.20 | 50.05 | 52.00 | | |
| 27 | 39.45 | 42.25 | 44.15 | 47.00 | 48.95 | 51.90 | 53.90 | | |
| 28 | 41.50 | 44.30 | 46.30 | 49.25 | 51.30 | 53.35 | 56.45 | | |
| 29 | 42.95 | 45.95 | 48.00 | 51.05 | 53.15 | 56.30 | 58.45 | 61.65 | |
| 30 | 45.00 | 48.10 | 50.25 | 53.40 | 55.60 | 58.85 | 61.10 | 64.40 | |
| 31 | 46.55 | 49.75 | 51.95 | 55.20 | 57.45 | 60.80 | 63.15 | 66.55 | |
| 32 | 48.80 | 52.15 | 54.45 | 57.85 | 60.20 | 63.70 | 66.10 | 69.60 | |
| 33 | 50.35 | 53.75 | 56.15 | 59.60 | 62.05 | 65.60 | 68.10 | 71.70 | 74.25 |
| 34 | 52.60 | 56.15 | 59.60 | 62.20 | 64.70 | 68.40 | 70.95 | 74.70 | 77.35 |
| 35 | 54.30 | 58.15 | 60.55 | 64.10 | 66.70 | 70.50 | 73.15 | 77.00 | 79.70 |
| 36 | 56.65 | 60.40 | 63.05 | 66.85 | 69.55 | 73.45 | 76.20 | 80.15 | 82.90 |
| 38 | 60.95 | 64.95 | 67.75 | 70.80 | 74.65 | 78.75 | 81.65 | 85.80 | 88.70 |
| 40 | 64.15 | 68.25 | 71.10 | 75.20 | 78.10 | 82.30 | 85,25 | 89.50 | 92.55 |
| 42 | 68.15 | 72.40 | 75.40 | 79.70 | 82.70 | 87.00 | 90.05 | 94.35 | 97.45 |
| | 72.70 | 77.20 | 80.35 | 84.85 | 87.95 | 92.60 | 95:80 | 100.40 | 103.70 |
| 44 46 | 77.25 | 82.00 | 87.75 | 90.10 | 93.50 | 98.35 | 101.80 | 106.70 | 110.15 |
| | 81.85 | 86.85 | 90.40 | 95.45 | 99.05 | 104.20 | 107.85 | 113.00 | 116.70 |
| 48 | | | | | 104.95 | 110.40 | 116.30 | | |
| 50 | 86.75 | 92.00 | 95.80 | 101.10 | 111.30 | 116.40 | 121.05 | 119.80 | 123.75 130.85 |
| 52 | 92.10 | 97.65 | 101.65 | 107.25 | | 123,60 | 127.95 | 126.75 | |
| 54 | 97.45 | 103.25 | 107.50 | 113.35 | 117.65 | | | 133,95 | 138.30 |
| 56 | 103.00 | 109.10 | 113.60 | 119.75 | 124.30 | 130.55 | 135.15 | 141.45 | 146.05 |
| 58 | 108.75 | 115.15 | 119.85 | 126.30 | 131.05 | $137.80 \\ 145.15$ | 142.45 150.35 | 149.10 | 154.05 |
| 60 | 114.50 | 121.25 | 126.30 | 133.10 | 138.20 | | | 157.35 | 162.60 |
| 62 | 119.95 | 127.00 | 132.30 | 139.45 | 144.85 | 152.15 | 157.65 | 165.05 | 170.60 |
| 64 | 124.60 | 131.80 | 137.20 | 144.50 | 150.00 | 157.45 | 163.10 | 170.20 | 176.60 |
| 66 | 129.35 | 136.70 | 142.20 | 149.65 | 155.30 | 163.00 | 168.85 | 176.70 | 182.70 |
| 68 | 134.25 | 141.75 | 147.40 | 155.05 | 160.80 | 168.65 | 174.60 | 181.65 | 188.80 |
| 70 | 139.95 | 147.75 | 153.60 | 161.55 | 167.60 | 175.80 | 182.05 | 190.45 | 196.85 |
| 72 | 145.40 | 153.50 | 159.65 | 167.95 | 174.30 | 182.85 | 189.40 | 198.20 | 205.00 |
| 74 | 151.50 | 159,90 | 166.30 | 174.90 | 181.50 | 190.40 | 197.25 | 206.35 | 213.40 |
| 76 | 157.75 | 166.45 | 173.10 | 182.05 | 188.95 | 198.15 | 205.25 | 214.65 | 221.95 |
| 78 | 164.20 | 173.25 | 180.20 | 189.45 | 196.60 | 206.10 | 213.45 | 223.15 | 230.70 |
| 84 | 184.95 | 194.95 | 202.75 | 213.00 | 221.05 | 231.60 | 239.90 | 250.70 | 259.10 |
| 90 | 207.65 | 218,65 | 227.30 | 238.55 | 247.45 | 259.10 | 268.30 | 280.15 | 289.5 |
| 96 | 232,35 | 244.40 | 253.90 | 266.15 | 275.85 | 288.35 | 298.25 | 310.95 | 321.00 |
| 102 | 253.40 | 266.25 | 276.35 | 289.30 | 299.50 | 312.60 | 322.90 | 336.10 | 346,50 |
| 108 | 274.90 | 288.60 | 299.40 | 313.25 | 324.70 | 338.25 | 349.40 | 363.55 | 374.80 |
| 120 | 326,40 | 341.90 | 354.25 | 369.95 | 382.50 | 398.45 | 411.20 | 427.35 | 440.35 |

DODGE IRON PULLEYS

Additional Prices to be Added to List Prices for Tight and Loose and Flanged Iron Pulleys

TIGHT AND LOOSE

| Diameter | FACE, INCHES | | | | | | | | | | |
|----------|--------------|---------|---------|----------|-----------|-----------|-----------|--|--|--|--|
| Inches | 3 and 4 | 5 and 6 | 7 and 8 | 9 and 10 | 11 and 12 | 13 and 14 | 15 and 16 | | | | |
| 6 to 9 | 1.30 | 2.00 | 3.00 | 4.50 | | | | | | | |
| 10 " 15 | 1.50 | 2.30 | 3.40 | 5.00 | 7.00 | | | | | | |
| 16 " 20 | 2.10 | 2.90 | 4.00 | 5.50 | 7.50 | | | | | | |
| 21 " 30 | 3.30 | 4.10 | 5.20 | 6.80 | 9.10 | 12.50 | | | | | |
| 31 " 42 | 4.50 | 5.50 | 6.90 | 9.00 | 12.10 | 16.50 | 23.00 | | | | |
| 43 " 60 | 6.00 | 7.40 | 9.30 | 12.00 | 15.80 | 21.00 | 29.00 | | | | |

FLANGE

| Diameter Inches | Price Each | Diameter Inches | Price Each | Diameter Inches | Price Each |
|--------------------|---------------|--------------------|---------------|--------------------|---------------|
| 6 to 7 | 2.40 | 34 to 35 | 20.05 | 76 to 78 | 73.75 |
| 8 " 9 | 3.10 | 36 " 37 | 21.95 | 80 " 82 | 79.30 |
| 10 " 11 | 3.90 | 38 " 39 | 24.10 | 84 " 86 | 84.75 |
| 12 " 13 | 4.70 | 40 " 41 | 26.35 | 88 " 90 | 90.10 |
| 14 " 15 | 5.65 | 42 " 43 | 28.75 | 92 " 94 | 95.40 |
| 16 " 17 | 6.60 | 44 " 45 | 31.30 | 96 " 98 | 100.85 |
| 18 " 19 | 7.60 | 46 " 47 | 33.85 | 100 " 102 | 106.00 |
| 20 " 21 | 8.80 | 48 " 50 | 37.60 | 104 " 106 | 111.80 |
| 22 " 23 | 10.15 | 52 " 54 | 42.25 | 108 " 110 | 117.15 |
| 24 " 25 | 11.50 | 56 " 58 | 47.20 | 112 " 114 | 122.35 |
| 26 " 27 | 13.05 | 60 " 62 | 52.25 | 116 " 118 | 127.35 |
| 28 " 29 | 14.70 | 64 " 66 | 57.50 | 120 | 132.05 |
| 30 " 31 | 16.40 | 68 " 70 | 62.85 | | |
| 32 " 33 | 18.20 | 72 " 74 | 68.30 | | |

The foregoing list is for double flange only.

Pulleys with but one flange are one-half of this list.

Those with three flanges are one and one-half times above list.

WHEN ORDERING OBSERVE THE FOLLOWING

Dimensions and other details should be in the following order: Diameter, width of face, straight or crown, bore, set screws or key way, single or double belt, single or double arms.

If pulley is special, send sketch showing exact dimensions of special features.

State if set screws or key ways are wanted; if both are required, whether set screws are to be on key.

When key ways are wanted, specify whether Dodge Standard Flat or Dodge Taper (1/8-inch to foot) or according to dimensions to be furnished.

Driving pulleys for shifting belt should have straight face, and for non-shifting belt should have crown face.

Tight and losse pulleys should have crown face. Hubs of tight and loose pulleys

are faced, and loose pulley bores are reamed.

When so ordered, loose pulleys will be bushed, or provided with solid or split sleeve.

Prices quoted on bushings on receipt of inquiry and specifications. For price of sleeves, see price list of sleeves for tight and loose wood pulleys.

Clamp hub pulleys (split hub and solid rim). To determine the list price, add one-

half the difference between the lists of solid and split pulleys to that of the solid.

ADDITIONAL CHARGES

If hub is chambered, or faced, or longer than standard lengths.

If bore is larger than standard.

Price lists of pulleys cover either set screws or key way. If both are required an additional charge will be made.

Diameters larger than 36-inch not in even inches, will take the list price of the next larger size in even inches, and fractional diameters not listed will take the list price of the size two inches larger.

M. & W. CUT-OFF COUPLINGS AND CLUTCH PULLEYS

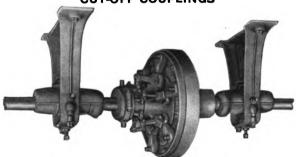


Fig. 9510A

| Diameter of Shaftinches | 15 216 | 13/16 | 176 | 111/6 | 115/6 | 23/6 | 27/16 |
|--|---|--|---------------------------------|--|---|---|------------------------------|
| Size of Clutchinches | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
| Highest Speed Cut-Off should run | | 375 | 350 | 325 | 300 | 275 | 250 |
| Capacity at 100 r. p. mh. p. | 1# | $2\frac{1}{2}$ | 5 | 7 | 12 | 18 | 25 |
| Weight pounds | 33 | 42 | 68 | 115 | 202 | 295 | 367 |
| Priceeach | 18.00 | 21.00 | 26.00 | 35.00 | 45.00 | 56.00 | 75.00 |
| " Additional for Splitting " | | 1 | 3.50 | 4.75 | 6.00 | 7.25 | 8.50 |
| | | <u> </u> | 1 13.00 | 1.10 | 0.00 | 1.20 | 0.00 |
| Diameter of Shaftinches | | 215/6 | 37/16 | 315/6 | 47/6 | 415/6 | 578 |
| | 211/16 | | | | | | |
| Diameter of Shaftinches Size of Clutchinches Highest Speed Cut-Off should run | 2 ¹¹ / ₁₆ 18 225 | 215/6 | 37/16 | 315/6_ | 47/6 | 415/6 | 578 |
| Diameter of Shaftinches Size of Clutchinches Highest Speed Cut-Off should run | 2 ¹¹ / ₁₆ 18 225 | 215/16 20 | 37/16 | 3 ¹⁵ / ₁₆ 28 | 4 ⁷ / ₆ | 4 ¹⁵ / ₁₆ | 5.7 43 |
| Diameter of Shaft inches Size of Clutch inches | 2 ¹¹ / ₁₆ 18 225 34 | 2 ¹⁵ / ₁₆ 20 200 | 37/16 24 200 | 3 ¹⁵ / ₁₆ 28 200 | 4 ⁷ / ₆ 32 200 | 4 ¹⁵ 16 37 175 | 5 78 43 150 |
| Diameter of Shaftinches Size of Clutchinches Highest Speed Cut-Off should run Capacity at 100 r. p. mh. p. | 2 ¹¹ / ₁₆ 18 225 34 479 | 2 ¹⁵ / ₆ 20 200 45 715 | 37/6 24 200 65 1010 | 3 ¹⁵ / ₁₆ 28 200 85 | $ \begin{array}{r} 4^{7} \% \\ 32 \\ 200 \\ 112 \\ 1765 \end{array} $ | 4 ¹⁵ / ₁₆ 37 175 142 2600 | 5 78 43 150 180 |

The above table gives the size clutch equal in power with the shaft.

In case the full power of shaft is not required to be transmitted, a smaller clutch can be used.

Couplings can be bored for different size shafts.

The highest speed standard clutch should be run is given in the table, but the above clutches can be made to run 50 per cent., for which an additional charge of 15 per cent. is added. For higher speeds, a high-speed clutch must be used.

STANDARD CLUTCH WITH PULLEY



Fig. 9510B

CLUTCHES WITH EXTENDED SLEEVES



Fig. 9510C

Clutches with extended sleeves are for wood or steel pulleys. Prices and full information on request stating requirements.

DODGE SOLID FRICTION CLUTCH AND CUT-OFF COUPLINGS ORTON TYPE

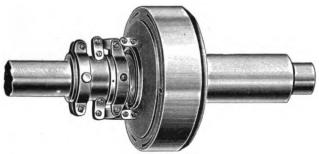


Fig. 6625A

| Size of | Largest Bore | Special Bore | HP. at 100 | *Rev. | WILL DRI | VE PULLEY | Price |
|------------------|----------------|----------------------|------------|---------------|-----------------|----------------|-------|
| Clutch Inches | Inches | ches luches R. P. M. | | per Minute | Diam. Inches | Face Inches | Each |
| 4 | 11/4 | | 11/4 | 600 | 12 | 4 | 15.00 |
| 5 | 11/2 | l | 2 | 580 | 15 | 4 | 17.00 |
| 6 | 13/4 | | 3 | 560 | 16 | 5 | 20.00 |
| 7 | 2 | | 4 | 540 | 20 | 6 | 22,00 |
| 8 | 21/4 | | 5 | 520 | 24 . | 6 | 27.00 |
| 9 | $2\frac{1}{2}$ | | 6 | 500 | 30 | 6 | 30.00 |
| 10 | 3 - | | 10 | 480 | 30 | 10 | 37.00 |
| ` 12 | 3 | 4 | 15 | 440 | 36 | 12 | 45.00 |
| 14 | 31/2 | 5 | 20 | 400 | 40 | 14 | 55.00 |
| 16 | 41/2 | 6 | 25 | 360 | 48 | 14 | 75.00 |

*Speeds shown above are for clutches as regularly built for ordinary factory requirements; when desired for higher speeds than shown above, prices will be quoted upon application accompanied by full information.

The above prices include sleeves.

Shifting yoke and fulcrum castings are furnished when specifications for same are given, without extra charge.

The sleeves are standardized for use with wood or iron pulleys, rope sheaves, gears, sprockets, etc.

EXTRA PARTS

| Size Clutch Inches | Price Cylin- drical Casing Each | Price Rings Each | Price Flanged Hub Each | Price Inside Driving Plate Each | Price Outside Driving Plate Each | Price Ex- tended Bushing Each | Price Lever Ring Each | Price Sliding Collar Each | Price Shifter Yoke Ring Each |
|--------------------------|---|------------------------|---------------------------------|---|--|---|--------------------------------|------------------------------------|--|
| 4 | 5.90 | 1.00 | 2.30 | 1.05 | 1.05 | 1.05 | .15 | .75 | .55 |
| 5 | 7.00 | 1.05 | 2.70 | 1.30 | 1.20 | 1.20 | .25 | 1.15 | .60 |
| 6 | 7.65 | 1.15 | 3.15 | 1.50 | 1.45 | 1.35 | .35 | 1.50 | .65 |
| 7 | 9.20 | 1.65 | 4.50 | 2.00 | 2.05 | 1.60 | . 4 5 | 1.70 | .75 |
| 8 | 11.35 | 1.95 | 5.25 | 2.30 | 2.25 | 1.80 | .50 | 2.20 | .95 |
| 9 | 12.45 | 2.30 | 5.70 | 2.55 | 2.40 | 2.10 | .60 | 2.50 | 1.25 |
| 10 | 14.55 | 2.50 | 6.60 | 3.00 | 2.70 | 2.30 | .60 | 2.80 | 1.45 |
| 12 | 18.20 | 3.35 | 8.35 | 3.75 | 3.55 | 3.15 | .85 | 3.50 | 1.70 |
| 14 | 22.30 | 4.00 | 10.35 | 4.65 | 4.35 | 3.75 | 1.05 | 4.30 | 2.10 |
| 16 | 23.65 | 4.20 | 12.30 | 4.85 | 4.60 | 3.90 | 1.10 | 4.50 | 2.35 |

DODGE SPLIT FRICTION CLUTCH AND CUT-OFF COUPLINGS

SPLIT FRICTION CLUTCHES



Fig. 6626A

| Size of Clutch Inches | Largest Size Clutch Will Bore Inches | Horse Power at 100 R. P. M. Will Transmit | *Speed R. P. M. | Price Each |
|--------------------------|--|---|--------------------|---------------|
| 10 | $2\frac{1}{2}$ | 6 | 450 | 38.50 |
| 12 | 3 ~ | 10 | 440 | 45.50 |
| 14 | 31/2 | 15 | 430 | 54.50 |
| 16 | 41/2 | 20 | 420 | 70.00 |
| 18 | 5 ~ | 25 | 410 | 90.00 |
| 20 | 6 | 32 | 400 | 110.00 |
| 22 | 6 | 40 | 390 | 135.00 |
| . 24 | 61/2 | 50 | 380 | 155.00 |
| 28 | 7 - | 80 | 360 | 190.00 |
| 30 | 71/2 | 98 | 350 | 238.00 |
| 3 6 | 8 2 | 128 | 325 | 310.00 |
| 42 | 10 | 174 | 300 | 380.00 |
| 48 | 10 | 242 | 275 | 455.00 |
| 54 | 12 | 340 | 2 50 | 575.00 |
| 60 | 12 | 480 | 225 | 720.00 |

SPLIT FRICTION CUT-OFF COUPLINGS

| Size of Couplings Inches | Size of Shaft Equal to Capacity of Coupling Inches | Largest Size Coupling Will Bore Inches | Horse Power at 100 R. P. M. Will Transmit | *Speed R. P. M. | Price Each |
|--------------------------------|--|--|---|--------------------|---------------|
| 10 | 111/16 | 21/2 | 6 | 450 | 49.00 |
| 12 | 115 | 3 - | 10 | 440 | 57.00 |
| 14 | 23/6 | $3\frac{1}{2}$ | 15 | 430 | 66.50 |
| 16 | 276 | $41\sqrt{2}$ | 20 | 420 | 84.50 |
| 18 | 2116 | 5 ~ | 25 | 410 | 105.00 |
| 20 | 215 6 | 6 | 32 | 400 | 125.50 |
| 22 | 33/16 | 6 | 40 | 390 | 151.00 |
| 24 | 37% | $6\frac{1}{2}$ | 50 | 380 | 172.00 |
| $\overline{28}$ | 315% | 7 - | 80 | 360 | 215.00 |
| 30 | 43% | 71 % | 98 | 350 | 264.00 |
| 36 | 4716 | 8 1 | 128 | 325 | 340.50 |
| 42 | 576 | 10 | 174 | 300 | 418.00 |
| $\overline{48}$ | 6 | 10 | 242 | 275 | 499.00 |
| $5\overline{4}$ | 61/2 | 12 | 340 | 250 | 610.00 |
| 60 | 8'2 | 12 | 480 | 225 | 810.00 |

^{*}Speeds as given are for clutches as are regularly built for ordinary factory requirements; when desired for higher speeds than shown above, prices will be quoted on application accompanied by full information.

DODGE STANDARD EXTENSION SLEEVES FOR DODGE SPLIT FRICTION CLUTCHES

10-INCH

| Whath of Luney Luce | | _ | | 7 | 8 | 9 | 10 |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Price, 17/6 and 11/6-in. Shafteach | 8.25 | 8.90 | 9.60 | 10.25 | 10.90 | 11.55 | 12.25 |
| " 1152 " 982 " " " " | 9.90 | 10.65 | 11.40 | 12.20 | 13.00 | 13.70 | 14.50 |
| " 27%-inch Shaft " | 10.60 | 11.45 | 12.20 | 13.00 | 13.80 | 14.50 | 15.30 |

12-INCH

| Width of Pulley Faceinches | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--|-------|-------|---------|-------|---------|-------|---------|-------|----------------|
| Price, 11% and 2% in. Shafteach | | | • • • • | | • • • • | | · · · · | 15.25 | 16.00 |
| " 276-inch Shaft " | | | | | | | | 16.10 | 16.90 |
| " $2\frac{11}{16}$ and $2\frac{15}{16}$ -in. Shaft " | 11.30 | 12.10 | 13.00 | 13.80 | 14.60 | 15.40 | 16.20 | 17.00 | 16.90 17.80 |

14-INCH

| Width of Pulley Paceinches | | 5 | 6 | 7 | 8 | 9 | 10 | | 12 | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price, *211 and 215 in. Shaft, each " 336 inch Shaft. " | | | | | | | | | | 19.40 | 21.00 |
| " 3 inch Shaft. " | 13.00 | 13.90 | 14.80 | 15.75 | 16.70 | 17.60 | 18.50 | 19.45 | 20.35 | 22.00 | 23.60 |
| "37/6 " " " | 15.00 | 15.90 | 16.80 | 17.75 | 18.75 | 19.75 | 20.75 | 21.80 | 22.80 | 24.80 | 26.80 |

*21%-inch shaft only for 14 inch Pulley Face.

16-INCH

| Width | of Pulley | Face, ir | ches | (| 3 | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 |
|-------|----------------------------|------------|------|---|---|---|---|---|----|----|------------------|----|----|---------|
| | 1 18 and 23% | | | | | | | | | | | | | |
| | 2%-inch | Shaft | | | | | | | | | 17.60 | | | • • • • |
| | 2^{i_1} and $*2^{i_1}$ | 6-in. Bhai | t " | | | | | | | | 18.60 | | | |
| | $3\frac{3}{16}$ -inch | | | | | | | | | | 20.60 | | | |
| • | $3\frac{7}{6}$ and 3^{1} | ⅓6-1D. Mai | | | | | | | | | 22.60 | | | |
| " | $3\frac{15}{16}$ -inch | Snart | | | | | | | | | $24.60 \\ 27.70$ | | | |

*21%-inch size only for 16-inch Pulley Face.

18-INCH

| | | | | | <u> </u> | _ | | | | | |
|---------------------------------------|-------|-----|-------|---------|----------|-----|---------|-----|----|----|-----------------------|
| Width of Pulley Face inches | | 7 | 8 | 9 | 10 | 11 | 12 | 14 | 16 | 18 | 20 |
| Price, 37/6 and 31/16-in. Shaft, each | | | | • • • • | | ··· | | ••• | | | 30.60 |
| " 31%-inch Shaft. " | • • • | ::: | ı | | | ::: | • • • • | ľ | | l | $\frac{32.60}{36.50}$ |
| " 415 " " " " | 24.10 | | 26.60 | | | | | | | | 41.60 |

20 AND 22-INCH

| Widt | h of Pu | lley P | ace i | inches | | 7 | | 8 | | 9 | T | 10 | _ | 11 | T | 12 | 1 | 4 | 1 | 6 | 1 | 8 | 2 | 0 | 22 |
|-------|---------|--------|--------|--------|----|-----|----|-----|----|-----|------|------|----|-------|----|------|-----|----|-----|----|----|-----|----|-----|-------|
| Price | , 31% | inch | Shaft, | each | | | | | Ι. | | ĺ | | | | 1 | | ٠. | - | · | | · | | | | 34.60 |
| ** | 4% | " | 44 | " | ١. | | ١. | | ١. | | ı | | | ١ | | | ١., | | ١., | | | | ١. | | 38.70 |
| 46 | 41% | 66 | " | " | ١. | | ١. | | ١. | | 1 | | | ۱ | 1 | | ١ | | ١., | | Ι. | | ١. | | 44.10 |
| 46 | 572 | 66 | " | 66 | 31 | .00 | 32 | .50 | 34 | .00 |) [3 | 35.4 | 10 | 36.85 | 38 | 3.30 | 41. | 30 | 44. | 30 | 47 | .30 | 50 | .30 | 53.30 |
| 46 | 6 | " | 44 | | | | | | | | | | | | | | | | | | | | | | 60.90 |

24-1NCH

| | | | ace i | | | 8 | | 9 | | 10 | | 1 | 1 | 2 | 14 | | 1 | 6 | 1 | 8 | 2 | 0 | 2 | 22 | 24 |
|----------|------|------|--------|------|----|-----|----|-----|----|-------|----|-----|-----|-----|------|----|-----|-----|----|-----|----|--------------|----|-----|----------------|
| | , 3% | inch | Shaft, | each | • | ٠. | | | | | | | ٠. | | | | | | | | • | • • | - | • • | 36.60 |
| 44 66 | 4 % | " | " | " | | • • | 1 | • • | | • • | | • • | • • | • • | | • | • • | • | ٠ | • • | ٠ | • • | | • • | 40.90 46.60 |
| * | 5% | 66 | " | " | | | ŀ | • • | | • • | | • • | :: | | ::: | | | - | | | 1 | | l | • • | 56.30 |
| 66 | 6 | 66 | " | " | | • • | | | | | | | ١ | | | | | | ١. | | ١. | | ١. | | 64.30 |
| 66 | 61/2 | 66 | " | " | 46 | .00 | 48 | .00 | 50 | 00.00 | 52 | .00 | 54. | .00 | 58.0 | 00 | 62 | .00 | 66 | .00 | 70 | . 0 0 | 74 | .00 | 78.00 |



DODGE SHAFTING COUPLINGS

RIBBED COMPRESSION







01160

Fig. 9116A

RIBBED AND FLANGED

| | LIE. | ATTOD |
|----|------|-------|
| ED | | |

| Shaftinches | 13/6 | 17/6 | 111/6 | 1^{13}_{16} | 23/6 | 276 | 211/16 | 215/6 | 33/6 |
|--|-------|-------|-------|---------------|-------|-------|--------|-------|-------|
| Price, Ribbedeach | 3.05 | 4.20 | 6.30 | 7.40 | 9.00 | 10.00 | 11.00 | 13.00 | 16.50 |
| " Flanged, not Fittedper pair | 7.50 | 8.00 | 8.50 | 9.00 | 10.50 | 12.50 | 15.25 | 18.25 | 21.75 |
| " Flanged, not Fittedper pair " Fitted" | 9,90 | 10.50 | 11.10 | 11.75 | 13.40 | 15.60 | 18.50 | 21.75 | 25,75 |
| Shaftinches | 37/6 | 311/6 | 315/6 | 4 3 16 | 4 7/6 | 411/6 | 415/6 | 51/2 | 6 |
| Price, Ribbedeach | 20.00 | 24.00 | 28.00 | | 38,00 | | | | |
| " Flanged, not Fittedper pair " Fitted " | 25.25 | 29.25 | 33.25 | 38.25 | 43.25 | 49.00 | 54.75 | 67.00 | 81.00 |
| " "Fitted" " | 29,75 | 34.25 | 39.25 | 45.00 | 51.25 | 57.75 | 64.75 | 78.00 | 93.00 |

KEYLESS COMPRESSION

SQUARE JAWS PLANED

JAW CLUTCH

SPIRAL RIGHT OR LEFT



Fig. 9116C



Fig. 9116 D



Fig. 9116E

KEYLESS COMPRESSION

| Shaftinches | 13/6 17/6 | 111/16 | 115/6 | 2% | 21/6 | 21/16 | 25% |
|-------------|------------|--------|-------|------|-------|-------|-------|
| Priceeach | 4.75, 5.50 | 6.25 | 8.00 | 9.00 | 10.75 | 13.00 | 16.00 |

JAW CLUTCH-SQUARE OR SPIRAL

| Shaftinches | 15/6 | 13/16 | 17/6 | 111116 | 115/6 | 23/16_ | 27/6 | 211/16 | 2156 |
|------------------------|-------|-------|-------|-------------|--------|--------|--------|--------|--------|
| Price each | 6.50 | 7.00 | 8.00 | 8.50 | 9.C0 | 11.25 | 14.25 | 18.50 | 22.75 |
| Length of Lever inches | 48 | 48 | 48 | 48 | 54 | 54 | 54 | 54 | 54 |
| Price, Lever each | 1.50 | 1.50 | 1.50 | 1.50 | 1.65 | 1.75 | 2.40 | 2.40 | 2.40 |
| " Pitting to Shaft " | 3.00 | 3.00 | 4.00 | 4.25 | 4.50 | 4.50 | 4.50 | 4.75 | 5.CO |
| "_*Complete " | 11.00 | 11.50 | 13 50 | 14.25_{-} | 15.15 | 17.50 | 21.15 | 25.65 | 30.15 |
| Shaftinches | 37/16 | 315/6 | 4.716 | 5 | 51/2 | 6 | 61/2 | 7 | 8 |
| Priceeach | 30.00 | 39.00 | 52.00 | 70.00 | 95.00 | 130.00 | 150.0C | 175.00 | 225.00 |
| Length of Lever inches | 54 | 60 | 60 | 66 | 66 | 72 | 72 | 78 | 84 |
| Price, Lever each | | 3.25 | 3.25 | 4.10 | 4.10 | | | 5.10 | 6.20 |
| " Fitting to Shaft " | 7.50 | 9.75 | 13.50 | | 20.00 | | | 25.00 | |
| " *Complete " | 39.90 | 52.00 | 68.75 | 91.10 | 119.10 | 160.10 | 180.10 | 205.10 | 256.20 |

^{*}Complete includes: Clutch, thrust collar, feather key, shifter yoke, and lever, "F" ring and fitting to shaft.

In ordering spiral jaw couplings specify whether right or left hand.

BOND SHAFTING COUPLINGS

RIBBED COMPRESSION

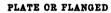








Fig. 8080B

RIBBED COMPRESSION

| Size of Shaftinches | 176 | 13/16 | 17/16 | 111/16 | 111/16 | 23/6 | 27/6 | 211/16 | 215/6 |
|---------------------|-------|-------|-------|--------|--------|-------|--------|--------|-------|
| Size of Keysinches | 14 | 516 | 3/8 | 1/6 | 1/2 | %6 | 5/8 | 11/6 | 3/4 |
| Priceeach | 4.50 | 5.00 | 6.00 | 7.00 | 8.50 | 10.00 | 11.00 | 12.50 | 15.00 |
| Size of Shaftinches | 33/16 | 37/16 | 311/6 | 315/6 | 43/6 | 476 | 411/16 | 415/6 | |
| Size of Keysinches | 34 | 7/8 | 7/8 | 1 | 1 | 11/8 | 11/8 | 11/8 | |
| Priceeach | 19.00 | 21.50 | 24.50 | 28.00 | 33.00 | 38.00 | 43.00 | 48.00 | |

Intermediate or odd sizes charged at next higher list. For Reducing Couplings, add 10 per cent to the list on larger size.

PLATE OR FLANGED

| | 100 | 1 444 | | | 201 | () = (| 201. | | |
|------------------------|-------|-------|-------|--------------------|-------|-----------------|---------------|--------|--------|
| Size of Shaftinches | 13/16 | 11/6 | 1116 | 156 | 23/16 | $2\frac{7}{16}$ | 2^{11}_{16} | 215/5 | 33/16_ |
| Size of Keysinches | 5/6 | 3 8 | 7/6 | 1/2 - | 916 | 5/8 | 11/16 | 3/4 | 3/4 |
| Price, not Fitted each | 8.00 | 9.00 | 10.50 | $\overline{11.50}$ | 13.00 | 14.50 | 17.50 | 21.50 | 26.00 |
| " Fitted " | 12.00 | 13.00 | 14.50 | 15.50 | 17.50 | 19.50 | 23.00 | 27.50 | 34.00 |
| Size of Shaftinches | 37/6 | 311/6 | 315/6 | 43/6 | 47/6 | 411/6 | 415/6 | 51/6 | 515/6 |
| Size of Keysinches | 7/8 | 7/8 | 1 | 1 | 11/8 | 11/8 | 11/8 | 1!4 | 11/4 |
| Price, not Fitted each | 28,50 | 33,50 | 36.00 | 49.00 | 63.00 | 68.00 | 75.00 | 88.00 | 103.00 |
| " Fitted " | | | | | 72.00 | 78.00 | 88.00 | 102.00 | 120.00 |

For Reducing Couplings, add 10 per cent to the list on larger size.

SQUARE JAW CLUTCH



Fig. 8080C

| Diameter of Shaftinches | | | | | | | | |
|---|-----------------------|------------------|----------------|----------------|--------------------------|-----------------------|-----------------------|-----------------------|
| Price, not Fitted each "Fitted on Shaft " | 14.00 17.50 | $15.00 \\ 20.00$ | 16.00 21.00 | 17.00 23.00 | 19.00 26.00 | $\frac{22.00}{29.00}$ | $\frac{28.00}{37.00}$ | $\frac{34.00}{44.00}$ |
| Diameter of Shaftinches Price, not Fittedeach | 37/6 | 311/16 | 315/6 | 47/6 | 415/16 | 576 | 515/6 | |
| Price, not Fittedeach "Fitted" | $\frac{38.00}{48.00}$ | 45.00 60.60 | 50.00 65.00 | 65.00 80.00 | 85.00 10 5 .00 | $100.00 \\ 120.00$ | 120.00 140.00 | |

For reducing Couplings, add 10 per cent to the list on larger size.

DODGE SHAFTING COLLARS AND SLEEVE COUPLINGS

SOLID

SAFETY COLLARS

SPLIT







SOLID

Fig. 9115B

| Shaftinches | 15/6 | 13/6 | 17/6 | 111/16 | 111/16 | 28/16 | 21/16 | 211/16 |
|-------------|--------|-------|-------|--------|--------|-------|-------|--------|
| Price each | .65 | .80 | 1.00 | 1.20 | 1.40 | 1.60 | 1.80 | 2.10 |
| Shaftinches | 215/6 | 33/16 | 3.7/6 | 311/6 | 315/6 | 43/6 | 47/6 | 411/6 |
| Price each | 2.40 | 2.70 | 3.00 | 3.30 | 3.60 | 4.15 | 4.70 | 5.30 |
| Shaftinches | 415/16 | 53/6 | 5 1/6 | 511/6 | 513/6 | 63% | 61/16 | 611/18 |
| Price each | 5,90 | 6.55 | 7.20 | 7.90 | 8.60 | 9.35 | 10.10 | 10.90 |
| Shaftinches | 615/6 | 71/2 | 8 | 814 | 9 | 91/2 | 10 | |
| Price each | 11.70 | 14.05 | 16.20 | 18.45 | 20.70 | 23.10 | 25.75 | |

SPLIT

| | | · | | | | | |
|--------|---------------------------|--|---|--|--|---|--|
| 15/16 | 13/6 | 1.7/6 | 111/16 | 115/6 | 23/16 | 27/16 | 211/16 |
| .95 | 1.20 | 1.50 | 1.80 | 2.10 | 2.40 | 2.70 | 3.15 |
| 2176 | 33/16 | 31/6 | 311/6 | 315/6 | 43/6 | 4 7/6 | 411/6 |
| 3.60 | 4.05 | 4.50 | 4.95 | 5.40 | 6.25 | 7.05 | 7.95 |
| 415/16 | 53/6 | 57/6 | 511/6 | 515 | 63/6 | 67/6 | 611/6 |
| 8.85 | 9.80 | 10.80 | 11.85 | 12.90 | 14.05 | 15.15 | 16.35 |
| 615/16 | 7½ | 8 | 81/2 | 9 | 9½ | 10 | |
| 17.55 | 21.10 | 24.25 | 27.65 | 31.05 | 34.70 | 38.65 | · |
| | .95 25% 3.60 45% 8.85 65% | .95 1.20 21½6 3¾6 3.60 4.05 41½6 5¾6 8.85 9.80 61½6 7½ | .95 1.20 1.50 21\(^{\begin{subarray}{c cccc} 21\\^{\begin{subarray}{c cccc} 21\\^{\begin{subarray}{c cccc} 3.60 & 3.66 & 3.66 & 3.66 & 4.50 & 4.50 & 4.50 & 4.50 & 4.50 & 4.50 & 5.66 & 5.66 & 5.66 & 5.66 & 5.66 & 7.1\(^{\begin{subarray}{c cccc} 21\\ 21\\ 21\\ 21\\ 21\\ 21\\ 21\\ 21\ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

These set collars are made solid and split for all sizes of shafting, and comply with all the legal requirements as to safety by having set screws and bolts protected. Finished and polished on periphery and faced on ends.

SOLID SLEEVE COUPLINGS FOR LIGHT SHAFTING



Fig. 9115C

| Shaftinches | 15,6 | 13/6 | 156 | 17/6 | 111/6 | 111/6 |
|-------------|------|------|------|------|-------|-------|
| Priceeach | 3.00 | 3.50 | 3.75 | 4.00 | 4.50 | 5.50 |



BOND SAFETY SET COLLARS

SCLID



Fig. 8082A

SPLIT





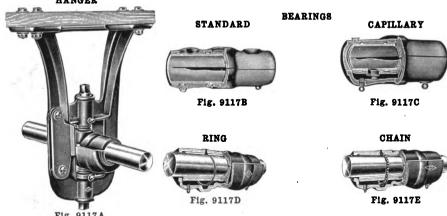
SOLID

| Sizeinches | 15/16 | 1 | 11/8 | 13/16 | 11/4 | 15% | 13/8 | 17/6 | 112 | 1% | 15/8 | 111/6 |
|------------|--------|--------|-------|-------------------|-------|------|-------|------|------|------|------|-------|
| Priceeach | .62 | .65 | .75 | .80 | .85 | .90 | .95 | 1.00 | 1.05 | 1.10 | 1.15 | 1.20 |
| Sizeinches | 13/4 | | | | | 21/8 | | | , , | | | 25/8 |
| Priceeach | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.55 | 1.60 | 1.65 | 1.75 | 1.80 | 1.88 | 2.03 |
| Sizeinches | 1 / 20 | | | | | | 31/8 | | | 33/8 | 37/6 | 31/2 |
| Priceeach | 2.10 | 2.17 | 2.25 | 2.32 | 2.40 | 2.48 | 2.63 | 2.70 | 2.77 | 2.92 | 3.00 | 3.08 |
| Sizeinches | 3% | 35/8 | 311/6 | 33/4 | 313/6 | 37% | 315/6 | 4 | 4% | 41/4 | 47/6 | 41/2 |
| Priceeach | 3.14 | 3.22 | 3.30 | $\overline{3.37}$ | 3.45 | 3.52 | 3.60 | 3.73 | 4.15 | 4.28 | 4.70 | 4.85 |
| Sizeinches | | 411/16 | | | | | | 51/8 | | | | 55/8 |
| Priceeach | 5.15 | 5.30 | 5.45 | 5.60 | 5.75 | 5.90 | 6.06 | 6.23 | 6.67 | 7.00 | 7.20 | 7.50 |

SPLIT

| Sizeinches | 15/16 | 1 | 11/8 | 13/16 | 11/4 | 15/16 | 13/8 | 17/16 | $1\frac{1}{2}$ | 1% | 15/8 |
|------------|--------|-------|--------|-------|--------|--------|--------|--------|----------------|--------|------|
| Priceeach | .93 | .97 | 1.13 | 1.20 | 1.27 | 1.35 | 1.43 | 1.50 | 1.57 | 1.65 | 1.72 |
| Sizeinches | 111/16 | 13/4 | 113/16 | 17/8 | 115/16 | 2 | 21/8 | 23/16 | $2\frac{1}{4}$ | 23/8 | 27/6 |
| Priceeach | 1.80 | 1.87 | 1.95 | 2.03 | 2.10 | 2.17 | 2.32 | 2.40 | 2.57 | 2.63 | 2.70 |
| Sizeinches | 21/2 | 25/8 | 211/16 | 23/4 | 213/16 | 27/8 | 215/16 | 3 | 31/8 | 33/16 | 314 |
| Priceeach | 2.82 | 3.05 | 3.15 | 3.25 | 3.38 | 3.48 | 3.60 | 3.72 | 3.95 | 4.05 | 4.15 |
| Sizeinches | 33/8 | 37/6 | 31/2 | 3% | 35/8 | 311/16 | 33/4 | 313/16 | 37/8 | 315/16 | 4 |
| Priceeach | 4.38 | 4.50 | 4.62 | 4.71 | 4.83 | 4.95 | 5.05 | 5.18 | 5.28 | 5.40 | 5.60 |
| Sizeinches | 43/16 | 41/4 | 47/6 | 41/2 | 45/8 | 411 | 43/4 | 413/16 | 47/8 | 415/16 | 5 |
| Priceeach | 6.22 | 6.42 | 7.05 | 7.28 | 7.56 | 7.95 | 8.18 | 8.45 | 8.62 | 8.85 | 9.10 |
| Sizeinches | 51/8 | 53/8 | 57/16 | 51/2 | 55/8 | 57/8 | 515/6 | | | | |
| Priceeach | 9.35 | 10.00 | 10.50 | 10.80 | 11.25 | 12.00 | 13.00 | | | | |

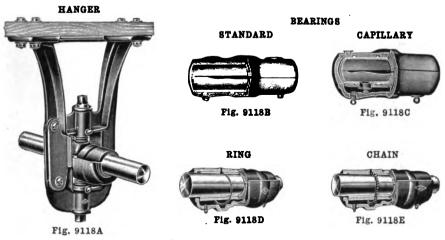
DODGE ADJUSTABLE BALL AND SOCKET HANGERS



| Shaft | | 1 | | | | DEOP, | INCHES | | | | |
|--------|---------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|------------------------------|
| Inches | Bearing | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
| 15/6 | Standard Capillary Wick | | 4.00 4.95 4.15 | 4.20 5.15 4.35 | 4.45 5.40 4.60 | | | | | | |
| 13/16 | Standard Capillary Ring Wick | 3.95 4.95 5.15 4.15 | 4.10 5.10 5.30 4.30 | 4.30 5.30 5.50 4.50 | 4.55 5.55 5.75 4.75 | | | | | | |
| 17/6 | Standard Capillary Ring Wick | 4.90 5.70 5.90 5.25 | 5.05 5.85 6.05 5.40 | 5.25 6.05 6.25 5.60 | 5.50 6.30 6.50 5.85 | 5.60 6.40 6.60 5.95 | 6.00 6.80 7.00 6.35 | 6.45 7.25 7.45 6.80 | | | |
| 111/16 | Standard Capillary Ring Wick | 5.00 5.95 6.15 5.35 | 5.15 6.10 6.30 5.50 | 5.35 6.30 6.50 5.70 | 5.60 6.55 6.75 5.95 | 5.70 6.65 6.85 6.05 | 6.10 7.05 7.25 6.45 | 6.55 7.50 7.70 6.90 | | | |
| 115/16 | Standard Capillary Ring Wick | 6.85 8.75 9.00 7.30 | 7.35 9.25 9.50 7.80 | 7.50 9.40 9.65 7.95 | 7.80 9.70 9.95 8.25 | 8.05 9.95 10.20 8.50 | 8.30 10.20 10.45 8.75 | 8.80 10.70 10.95 9.25 | 9.65 11.55 11.80 10.10 | | ::: |
| - 3/6 | Standard Capillary Ring Wick | 8.70 10.70 10.95 9.25 | 9.05 11.05 11.30 9.60 | 9.20 11.20 11.45 9.75 | 9.70 11.70 11.95 10.25 | 10.30 12.30 12.55 10.85 | 10.75 12.75 13.00 11.30 | 11.65 13.65 13.90 12.20 | 13.35 15.35 15.60 13.90 | 15.70 17.70 17.95 16.25 | 18.5 20.5 20.5 18.8 |
| 27/6 | Standard Capillary Ring Wick | 9.35 11.30 11.60 10.05 | 9.70 11.65 11.95 10.40 | 9.85 11.80 12.10 10.55 | 10.35 12.30 12.60 11.05 | 10.95 12.90 13.20 11.65 | 11.40 13.35 13.65 12.10 | 12.30 14.25 14.55 13.00 | 14.00 15.55 16.25 14.70 | 16.35 18.30 18.60 17.05 | 18.9 20.8 21.1 19.6 |
| 211/16 | Standard Capillary Ring Wick | 10.85 13.45 13.80 11.65 | 11.35 13.95 14.30 12.15 | 11.85 14.45 14.80 12.65 | 12.35 14.95 15.30 13.15 | 13.35 15.95 16.30 14.15 | 14.45 17.05 17.40 15.25 | 15.50 18.10 18.45 16.30 | 17.75 20.35 20.70 18.55 | 19.80 22.40 22.75 20.60 | 20. 23. 23. 21. |

Chain Oiling Bearings, same list as Ring Oiling. Wick Oiling Bearings not illustrated.

DODGE ADJUSTABLE BALL AND SOCKET HANGERS

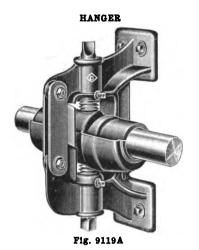


| Shaft | | | | | | Drop, | Inches | | | | |
|--------|---------------------------------------|------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Inches | Bearing | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
| 25% | Standard Capillary Ring Wick | | 13.30 16.70 17.05 14.45 | 13.80 17 20 17.55 14.95 | 14.30 17.70 18.05 15.45 | 15.30 18.70 19.05 16.45 | 16.40 19.80 20.15 17.55 | 17.45 20.85 21.20 18.60 | 19.70 23.10 23.45 20.85 | 21.75 25.15 25.50 22.90 | 22.50 25.90 26.25 23.65 |
| 33/6 | Standard Capillary Ring Wick | | 16.40 24.70 25.10 17.80 | 16.95 25.25 25.65 18.35 | 17.70 26.00 26.40 19.10 | 18.20 26.50 26.90 19.60 | 19.60 27.90 28.30 21.00 | 21.50 29.80 30.20 22.90 | 24.70 33.00 33.40 26.10 | 27.80 36.10 36.50 29.20 | 30.30 38.60 39.00 31.70 |
| 37/6 | Standard Capillary Ring Wick | | 16.85 27.05 27.55 18.25 | 17.40 27.60 28.10 18.80 | 18.15 28.35 28.85 19.55 | 18.65 28.85 29.35 20.05 | 20.05 30.25 30.75 21.45 | 21.95 32.15 32.65 23.35 | 25,15 35,35 35,85 26,55 | 28.25 38.45 38.95 29.65 | 30.75 40.95 41.45 32.15 |
| 3,1/6 | Standard Capillary Ring | | 21.85 30.45 31.00 | 23.40 32.00 32.55 | 23.90 32.50 33.05 | 26.05 34.65 35.20 | 26.80 35.40 35.95 | 28.70 37.30 37.85 | 33.95 42.55 43.10 | 37 40 46.00 46.55 | 41.95 50.55 51.10 |
| 356 | Standard Capillary Ring | | 26.10 32.20 32.80 | 26,65 33.75 34.35 | 27.15 34.25 34.85 | 29.30 36.40 37.00 | 30.05 37.15 37.75 | 31.95 39.05 39.65 | 37.20 44.30 44.90 | 40.65 47.75 48.35 | 45,20 52,30 52,90 |
| 43/6 | Standard Ring | | | | 30.75 38.20 | $32.70 \\ 40.15$ | 34.95 42.40 | 37.20 44.65 | 42.45 49.90 | $\frac{45.25}{52.70}$ | 51.20 58.65 |
| 4 1/16 | Standard Ring | •••• | • • • • • | | 32.00 40.95 | 33.95 42.90 | 36.20 45.15 | 38.45 47.40 | 43.70 52.65 | 46.50 55.45 | 52.45 61.40 |
| 411/6 | Standard Ring | •••• | •••• | | | 39.35 50.60 | 43.05 54.30 | 45.30 56.55 | 48.90 60.15 | 53.10 64.35 | 61.20 72.45 |
| 411/6 | Standard Ring | | | | | 42.40 55.75 | $\frac{46.10}{59.45}$ | 48.35 61.70 | 51.95 65.30 | 56.15 69.50 | 64.25 77.60 |

Chain Oiling Bearings, same list as Ring Oiling. Wick Oiling Bearings not illustrated.

DODGE ADJUSTABLE

BALL AND SOCKET POST HANGERS



STANDARD

BEARINGS

CAPILLARY







Fig. 9119C





Fig. 9119D

CHAIN



Pig. 9119E

STANDARD

| Shaftinches Priceeach | 4.40 | 13/6 4.50 | $\frac{1\frac{7}{6}}{5.50}$ | 111/ ₁₆ 5.60 | $\frac{11\frac{1}{16}}{7.15}$ | 23/6 9.75 | 27/6 10.40 |
|-------------------------|------|--------------|-----------------------------|----------------------------|-------------------------------|--------------|---------------|
| Shaft inches Price each | | | | | | | |

CAPILLARY

| Shaft inches Price each | 15/6 | 13/6 | 17/6 | 111/6 | 111/6 | 23/6 | 21/6 |
|-------------------------|--------|-------|-------|-------|-------|-------|-------|
| Priceeach | 5.35 | 5.50 | 6.30 | 6.55 | 9.05 | 11.75 | 12.35 |
| Shaftinches | 211/16 | 215/6 | 33/16 | 37/16 | 31/16 | 311/6 | |
| Priceeach | 15.60 | 18.35 | 27.30 | 29.65 | 34.05 | 35.80 | |

WICK OILING

| Shaftinches | 1.36 | 17/6 | 111/16 | 111/16 | 23/6 | 21/6 |
|--------------|-------|-------|--------|--------|-------|-------|
| Priceeach | | | | | | |
| Shaft inches | 211/6 | 215/6 | 33/6 | 31/16 | 31/16 | 35% |
| Priceeach | 13.80 | 16.10 | 20.40 | 20.85 | 27.50 | 31.40 |

RING OR CHAIN

| Shaft | inches | 1,316 | 17/6 | 111/6 | 115% | 23/6 | 2761 |
|-------|--------|--------|-------|-------|-------|-------|-------|
| Price | each- | 5.70 | 6.50 | 6 75 | 9.30 | 12.00 | 12.65 |
| Shaft | inches | 211/16 | 215/6 | 33/16 | 31/16 | 31/16 | 35/6 |
| Price | each | 15 95 | 18.70 | 27.70 | 30.15 | 34.60 | 36.40 |

DODGE HEAVY RIGID POST BEARINGS, SHAFT HANGERS AND PILLOW BLOCKS

HEAVY RIGID POST BEARINGS







| Fi | - | 07 | 00 | |
|-----|----|------|-----|-----|
| - 1 | 25 | 34.1 | -24 | I A |

| F1g. 9120A | Fig. 9120 | В | | | | | | |
|-----------------|-----------|--------|--------|--------|-------|--------|--------|--------|
| Shaft | . inches | 17/6 | 111/16 | 115/16 | 23/6 | 27/6 | 211/16 | 215/6 |
| Price, Standard | each | 3.60 | 4.10 | 5.45 | 7.25 | 8.35 | 9.15 | 10.35 |
| " Wick-oiling | " | 4.15 | 4.55 | 5.80 | 7.55 | 8.65 | 9.75 | 11.70 |
| " Capillary | " | 4.40 | 5.05 | 6.70 | 8.80 | 11.35 | 14.30 | 17.60 |
| " Ring or Chain | 44 | 4.70 | 5.35 | 7.00 | 9.10 | 11.65 | 14.65 | 17.95 |
| Shaft | . inches | 3 3/16 | 37/6 | 311/16 | 315/6 | 4 3/16 | 47/6 | 415/16 |
| Price, Standard | each | 12.70 | 14.10 | 18.40 | 22.40 | 27.15 | 31.90 | 40.10 |
| " Wick-oiling | " | 13.35 | 17.80 | 22.35 | 27.10 | | | |
| " Capillary | " | 21.00 | 24.35 | 28.00 | 31.50 | | | |
| " Ring or Chain | " | 21.40 | 24.85 | 28.55 | 32.10 | 38.55 | 45.00 | 51.45 |

SHORT DROP HEAD HANGERS OR ADJUSTABLE PILLOW BLOCKS SHORT DROP HEAD SHAFT HANGER ADJUSTABLE PILLOW BLOCK

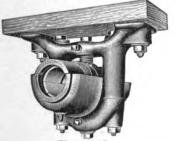


Fig. 9120D



Fig. 9120E

| Shaft inches | 176 | 11/16 | 115/6 | 23/6 | 276 | 211/16 | 215/6 | 33/6 |
|---------------------|-------|-------|-------|-------|-------|--------|-------|-------|
| Price, Standardeach | 4.45 | | | | | 13.45 | | |
| " Wick-oiling " | 4.75 | 4.85 | | | | 14.25 | | |
| " Capillary" | 5.25 | 5.50 | 8.55 | 10.70 | 11.30 | 16.05 | 18.80 | 27.85 |
| " Ring or Chain " | 5.45 | 5.70 | | | | | | |
| Shaft inches | 37/6 | 311/6 | 315/6 | 43/6 | 47/6 | 411/6 | 415/6 | |
| Price, Standardeach | | 26.75 | | | | | | |
| " Wick-oiling " | 21.40 | 28.80 | 32.70 | | | | | |
| " Capillary " | 30.20 | 35.35 | 37.10 | | | | , | |
| " Ring or Chain " | | 35.90 | | | | | | |

Above prices do not include base plates.

DODGE STANDARD AND SELF-OILING PILLOW BLOCKS COMMON FLAT BOX STANDARD RIGID PILLOW SELF-OILING RIGID PILLOW





Fig. 9121A

Fig. 9121B COMMON FLAT BOX

STANDARD AND WICK-OILING RIGID PILLOW BLOCKS

| Shartmenes | | | | | | | | | | |
|----------------------------------|------------------------------|----------|-----------------|---------|-----------|----------|---------|--------|---------|--------|
| Price, Standard each Wick Oiling | 1.30 | 1.60 | 2.10 | 2.70 | 3.70 | 4.60 | 5.50 | 7.00 | 8.80 | 11.00 |
| "Wick Oiling" | | 1.80 | 2.30 | 3.00 | 4.00 | 5.00 | 6.00 | 7.40 | 9.50 | 11.60 |
| Shaftinches | $3\frac{7}{16},3\frac{1}{2}$ | 311/6,33 | $3^{15}_{16},4$ | 43/6,41 | 47/6,43 | 411/6,43 | 415/6,5 | 576,51 | 515/6,6 | 676.61 |
| Price Standard each | 12.80 | 14.40 | 16.00 | 18.50 | 21.00 | 24.CO | 27.00 | 34.00 | 43.00 | 52.00 |
| " Wick Oiling " ; | 13.80 | | | | . | | | | | |

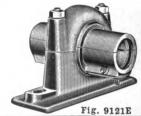
SELF-OILING RIGID PILLOW BLOCK AND QUILL BEARINGS

| Shart inches 1 16,14 1 | 16,13 1116,13 1116,2 | 2"16,21 2"16,25 | 2.,16,24 | 4.16,0 | 0,16,01 | 3,16,34 |
|---|----------------------------|-----------------|----------|--------|---------|---------|
| Price, Ring or Chain Oiling, ea 4.50 3.00 | .00 5.70 6.80 | 8.20 9.80 | 12.00 | 14.00 | 18.00 | 22.00 |
| " Capillary " " 3.00 5 | $5.50 \mid 4.20 \mid 5.20$ | 6.30 7.50 | 9.00 | 11.00 | 15.CO | 18.00 |
| Shaft inches 311/6,33 3 | | | | | | |
| Price, Ring or Chain Oiling, ea 27.00 3: | 2.00 37.00 42.00 | 48.00 54.00 | 60.00 | 66.00 | 73.00 | 80.00 |

STANDARD BALL AND SOCKET

CAPILLARY, COLLAR, RING OR CHAIN OILING

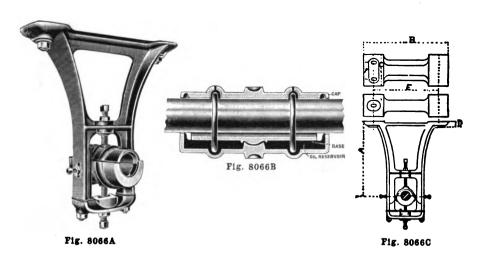




| Fig. | 9121D | | | | | | rig. 912 | TE | |
|---|-------------------------------|-------------------------------|--------------------------------|------------------|-------------------------------|-------------------------------|------------------------------|---------|----------|
| Shaftinches | $1\frac{3}{16}, 1\frac{1}{4}$ | $1\frac{7}{16}, 1\frac{1}{2}$ | $1\frac{11}{16}, 1\frac{3}{4}$ | $1^{15}_{16}, 2$ | $2\frac{3}{16}, 2\frac{1}{1}$ | $2\frac{7}{16}, 2\frac{1}{2}$ | $2\frac{1}{6}, 2\frac{3}{4}$ | 215/6,3 | 33/6, 34 |
| Price, Standard each | 3.30 | 3.90 | 4.60 | 5.60 | 7.00 | 9.00 | 11.50 | 14.00 | 17.00 |
| " Capillary Oiling" " Ring or Chain Oiling" | 4.30 | 4.90 | 5.60 | 6.60 | 8.00 | 10.30 | 13.00 | 16.00 | 20.00 |
| " Ring or Chain Oiling, " | 5.80 | 6.40 | 7.10 | 8.20 | 10.00 | 12.60 | 16.00 | 19.00 | 23.00 |
| " Collar Oiling " | 7.80 | 8.50 | 9.20 | 10.50 | 13.30 | 17.00 | 21.00 | 25.00 | 29.00 |
| Shaftinches | 37/6,31 | 31/6,34 | 315, 4 | 43/6, 41 | 47/6, 41 | 411/6, 48 | 415,5 | 576,51 | 515/6, 6 |
| Price, Standard each | | | | | | | | | |
| " Capillary Oiling " | 25.00 | 30.00 | 35.00 | | | | | | |
| " Ring or Chain Oi ing, " | 29.00 | 35,00 | 41.00 | 47.00 | 54.00 | 61.00 | 68.00 | | |
| " Collar Oiling " | 35.00 | 41.00 | 47.00 | 53.00 | 61.00 | 68.00 | 75.00 | 89.00 | 103.00 |

BOND PATENT RING OILING HANGERS

ADJUSTABLE BALL AND SOCKET, BABBITTED AND REAMED BEARINGS



| Size of Shaft | | op A | | Price | Length of Box | S | IZE OF BA | SE, INCHE | s | Во | LTS |
|------------------|------|------|-----|-------|------------------|-----------------|----------------|-------------------|-------|---------------|-----------|
| Inches | In | ches | | Each | Inches | В | C | D | E | Number | Size, Ins |
| 15/16 | | to 5 | 1/4 | 3.25 | 41/4 | 11 | 3 | 7/8 7/8 7/8 | 71/2 | 2 | 1/2 |
| | 0 | " 8 | | 3.50 | 41/4 | 111/4 | 31/4 | 7/8 | 83/4 | 2 | 1/2 |
| | 0 | " 10 |) | 3.75 | 41/4 | 12 | 33/8 | 7/8 | 91/2 | 2 | 1/2 |
| | 11 | " 13 | | 4.25 | 414 | $12\frac{5}{8}$ | 33/8 | 7/8 | 101/4 | 2 | 1/2 |
| | 14 | " 16 | | 4.75 | 41/4 | 16 | 33/4 | 7/8 | 121/2 | $\frac{1}{2}$ | 1/2 |
| 13/2 | 43/4 | " 5 | 1/4 | 4.00 | 5 | 121/4 | 3 | 7/8 | 87/8 | 2 | 5/8 |
| | 6 | " 8 | | 4.50 | 5 | 13 | 4 | 11/8 | 91/2 | 2 | 5/8 |
| | 0 | " 10 | | 4.75 | 5 | 143/8 | 41/8 | 11/8 | 103/4 | 2 | 5/8 |
| | TT | " 13 | 3 | 5.25 | 5 | $14\frac{3}{4}$ | 41/8 | 11/8 | 103/4 | 2 | 5/8 |
| | 1.1 | " 16 | | 5.75 | 5 | 157% | 47/8 | 11/8 | 12 | 2 | 5/8 |
| | 18 | " 20 |) | 6.25 | 5 5 | 183/4 | 51/4 | 11/8 | 15 | 2 | 5/8 |
| | 19 | " 21 | | 7.00 | 5 | 183/4 | 51/4 | 11/8 | 15 | 2 | 5/8 |
| 17/16 | 43/4 | " 5 | 1/4 | 4.50 | 6 | 121/4 | 3 | 7/8 | 87/8 | 2 | 5/8 |
| | 6 | " 8 | 1 | 5.00 | 6 | 13 | 4 | 11/8 | 91/2 | 2 | 5/8 |
| | 8 | " 10 |) | 5.25 | 6 | 143/8 | 41/8 | 11/8 | 103/4 | 2 | 5/8 |
| | 11 | " 13 | 3 | 5.75 | 6 | 143/4 | 41/8 | 11/8 | 103/4 | $\frac{2}{2}$ | 5/8 |
| | 1.1 | " 16 | 5 | 6.25 | 6 | 151/8 | 47/8 | 11/8 | 12 | 2 | 5/8 |
| | 10 | " 20 | | 6.75 | 6 | 183/4 | 51/4 | 11/8 | 15 | 2 | 5/8 |
| | 19 | " 21 | | 7.50 | 6 | 1834 | 51/4 | 11/8 | 15 | 2 | 5/8 |
| 11/16 | 0 | " 8 | 3 | 6.00 | 7 | 14 | 41/2 | 11/8 | 103/4 | 2 | |
| | 8 | " 10 |) | 6.25 | 7 | 153/8 | $4\frac{1}{2}$ | 11/8 | 115/8 | 2 | 5/8 |
| | 11 | " 13 | 3 | 6.75 | 7 | 151/2 | 43/4 | 11/8 | 115/8 | 2 | 5/8 |

BOND PATENT RING OILING HANGERS

ADJUSTABLE BALL AND SOCKET, BABBITTED AND REAMED BEARINGS

| Size of Shaft | Drop A | Price | Length | S | IZE OF BA | se, Inche | es | Bo | LTS |
|------------------|-----------------------|--|------------------|----------------------------------|--|---|-------|---|---------------------------------|
| Inches | Inches | Each | of Box Inches | В | C | D | E | Number | Size, Ins. |
| 111/16 | 14 to 16 | 7.25 | 7 | 17 | 434 | 11/8 | 13 | 2 | 5 8 5 8 5 8 5 8 3 4 |
| | 18 " 20 | 7.75 | 7 | $20\frac{3}{4}$ | 51/2 | 11/8 | 163/4 | 2 | 5/8 |
| | 22 " 24 | 8.25 | 7 | $22\frac{3}{6}$ | 6 | 11% | 1814 | 1 2 | 5% |
| | 26 "28 | 9.50 | 7 | 2334 | 61/6 | 1 1/8 1 1/8 1 3/6 | 191/2 | 2 | 3,4 |
| | 30 " 32 | 10.50 | 7 | $25\frac{3}{4}$ | $\frac{61/2}{63/4}$ | 13% | 213/8 | $\bar{2}$ | 3,4 |
| | 34 " 36 | 12.50 | 7 | 281/4 | 673 | 114 | 24 | $\overline{2}$ | 3/ |
| 115/6 | 6 "8 | 7.00 | 8 | 14 | 416 | 11/8 | 1034 | 5 | 5.6 |
| | 8 " 10 | 7.25 | 8 | 153/8 | 41/2 41/2 43/4 43/4 | 11/8 | 115% | 2 | 5% |
| | 11 " 13 | 7.75 | 8 | 151/2 | 437 | 118 | 1158 | 5 | 5% |
| | 14 " 16 | 8.25 | $\ddot{8}$ | 17 | 432 | 112 | 13 | 5 | 52 |
| | 18 " 20 | 8.75 | 8 | 203/4 | 51/2 | 11/8 11/8 | 1634 | 5 | 5.8 |
| | 22 " 24 | 9.50 | 8 | 223/8 | 6 | 1 1 78 | | 1 5 | 58 |
| | 26 " 28 | 12.00 | 8 | $\frac{2298}{2334}$ | | 118 | 1814 | 3 | 3/8 |
| | 30 " 32 | 14.00 | 8 | | $\frac{6\frac{1}{2}}{6\frac{3}{4}}$ | 1 316 | 191/2 | 2 | 34 |
| | 34 " 36 | 16.00 | | 253/4 | 074 | 1 3/16 | 213/8 | 2 | 34 |
| 23/6 | 8 " 10 | 9.00 | 8 . | 2814 | 678 | 114 | 24 | 2 | 34 |
| <i>2</i> ∕16 | 11 " 13 | | 9 | 173/8 | 5 | 114 | 13 | 2 | 1 24 |
| | 11 10 | 9.50 | 9 | $19\frac{1}{8}$ | 51/2 | 114 | 15 | 2 | 34 |
| | 114 10 | 10.00 | 9 | $21\frac{1}{8}$ | 6 | 11/4 | 17 | 2 | 34 |
| | 18 " 20 | 10.50 | 9 | $23\frac{1}{4}$ | 61/4 | 11/4 | 19 | 2 | 34 |
| | 22 " 24 | 11.00 | 9 | $25\frac{1}{4}$ | 714 | 114 | 21 | 2 | 34 |
| | 26 " 28 | 12.00 | 9 | 2714 | 71/2 | 13/8 | 23 | 2 | 34 |
| | 30 " 32 | 15.00 | 9 | 29 | 71/4 | 13/8 | 2414 | -1 | 34 |
| | 04 00 | 18.00 | 9 | 315/8 | 61/4 71/4 71/2 71/4 71/2 | 1 1 4 1 3 8 1 3 8 1 7 16 | 27 | 4 | |
| $2\frac{7}{16}$ | 8 " 10 | 10.00 | 10 | 173/8 | 5 | 11/4 11/4 11/4 | 13 | 2 | 3/1 |
| | 11 " 13 | 10.75 | 10 | 191/6 | 51/2 | 134 | 15 | 2 | 34 |
| | 14 " 16 | 11.50 | 10 | 211/8 | 16 | 11/ | 17 | 2 | 3/4 |
| | 18 " 20 | 12.50 | 10 | 2314 | 61/4 71/4 71/2 71/4 71/2 | 11/4 | 19 | 2 2 2 2 2 2 2 4 | 37 |
| | 22 " 24 | 13.50 | 10 | $25\frac{1}{4}$ | 71/4 | 1 11/4 | 21 | 2 | 37 |
| | 26 " 28 | 15.00 | 10 | 271/ | 71/3 | 13/8 13/8 17 ₁₆ | 23 | 2 | 37 |
| | 30 " 32 | 17.00 | 10 | 29 | 717 | 13% | 241/4 | 4 | 3.7 |
| | 34 " 36 | 20.00 | 10 | 3156 | 71/3 | 17% | 27 | 4 | 37 |
| 21/16 | 8 "10 | 12.50 | 11 | $\frac{315}{8}$ $\frac{1814}{4}$ | 6 | 15% | 14 | | l î* |
| | 11 " 13 | 13.50 | 11 | $20^{3}\frac{7}{4}$ | $6\frac{1}{2}$ $6\frac{1}{2}$ $7\frac{5}{8}$ | 15 8 15 8 15 8 15 8 15 8 15 8 | 161/4 | 2 2 2 2 2 2 2 4 | l i |
| | 14 " 16 | 14.50 | 11 | 23° | 612 | 15% | 1834 | 5 | l î |
| | 18 " 20 | 16.00 | lii | 2434 | 75% | 15% | 2014 | 5 | Î 1 |
| | 22 " 24 | 17.50 | îi | $263\frac{1}{4}$ | 8 | 15% | 2214 | 5 | i |
| | 26 " 28 | 19.00 | ii | 29 4 | 814 | 15% | 241/ | 5 | 1 1 |
| | 30 " 32 | 22.00 | îî | 311/2 | 81/2 89/6 | 134 | 2634 | 1 7 | 3/ |
| | 34 " 36 | 26.00 | lii | 3314 | 81/2 | 134 | 285% | 4 | 34 34 1 |
| 215/6 | 8 "10 | 14.00 | 12 | 1814 | $\begin{bmatrix} 6^{72} \end{bmatrix}$ | 15 4 | 14 | | 74 |
| / NO | 11 " 13 | 16.00 | 12 | $\frac{16.74}{20^34}$ | 612 | 134 158 158 158 158 158 158 | 1614 | 2 2 2 2 2 2 2 | 1 |
| | 14 " 16 | 17.00 | 12 | 20% | $\frac{612}{612}$ | 15 4 | 103/ | 2 3 | 1 |
| | 18 " 20 | 19.00 | 12 | $\frac{23}{24^34}$ | $\frac{6\frac{5}{2}}{75\frac{2}{8}}$ | 15% | 1834 | 2 | |
| | 22 " 24 | $\frac{19.00}{20.50}$ | 12 | 2474 | | 128 | 2014 | 2 | 1 |
| | 26 " 28 | $\frac{20.30}{22.00}$ | | 2634 | 8 | 158 | 221/4 | 2 | l i |
| | 30 " 32 | | 12 | 29 | 813 | 15 3 | 2414 | 2 | 1 |
| | 34 " 36 | $\begin{vmatrix} 25.00 \\ 28.00 \end{vmatrix}$ | 12 | 311/2 | 8% | 134 | 263/4 | 4 | 3/4 3/4 |
| 1 | 94 90 | 1.28.00 | 12 | 3318 | 813 | 134 | 285/8 | 4 | 9/4 |

BOND PATENT RING OILING HANGERS

ADJUSTABLE BALL AND SOCKET, BABBITTED AND REAMED BEARINGS

| Size of | Drop A | Price | Length of Box | | SIZE OF | Base, 1 | NCHES | | Во | LTS |
|-----------------|----------|---------|------------------|-----------------|---------------------------------|--------------|-----------------|--|--------|------------|
| Shaft Inches | Inches | Each | Inches | В | C | · D | Е | F | Number | Size, In |
| 33/16 | 11 to 13 | 19.00 | 13 | 21 | 7 | 134 | $15\frac{3}{4}$ | | 2 | 11/8 |
| 7.10 | 14 " 16 | 21.00 | 13 | 231/2 | 71/2 | 134 | 181/2 | 31/8 | 4 | 7/8 |
| | 18 " 20 | 23.00 | 13 | 26 | 8 | 134 | 201/2 | 31/8 | 4 | 7/8 |
| 1 | 22 " 24 | 24.50 | 13 | 283/4 | 8 | 134 | 2234 | 31/8 | 4 | 7/8 |
| | 26 " 28 | 26.00 | 13 | 31 | 9 | 134 | 251/2 | 31/8 | 4 | 1 |
| 1 | 30 " 32 | 28.00 | 13 | 333/4 | 93/4 | 13/4 | 28 | 31/8 | 4 | 1 |
| | 00 02 | | 13 | | 934 | 12/ | 29 | 31/8 | 4 | 1 |
| 07/ | 91 90 | 32.00 | | 35 | | 134 | 159/ | 078 | | 411 |
| 37/6 | 11 10 | 22.50 | 14 | 21 | 7 | 13/4 | 153/4 | 91/ | 2 | 11/8 |
| - 1 | 14 10 | 25.00 | 14 | 231/2 | 71/2 | 134 | 181/2 | 31/8 | 4 | 7/8 |
| 1 | 18 " 20 | 27.50 | 14 | 26 | 8 | 134 | 201/2 | 31/8 | 4 | 7/8 7/8 |
| | 22 " 24 | 29.00 | 14 | 283/4 | 8 | 13/4 | 2234 | 31/8 | 4 | 1/8 |
| | 26 " 28 | 31.00 | 14 | 31 | 9 | 134 | 251/2 | 31/8 | 4 | 1 |
| 1 | 30 " 32 | 32.50 | 14 | 333/4 | 93/4 | 134 | 28 | 31/8 | 4 | 1 |
| | 34 " 36 | 37.50 | 14 | 35 | 934 | 13/ | 29 | 31/2 | 4 | 1 |
| 311/16 | 11 " 13 | 25.00 | 143/4 | 237/8 | 8 | 17/8 | 18 | 31/8 | 4 | 7/6 |
| ->10 | 14 " 16 | 27.00 | 1434 | 2514 | 816 | 17/8 | 191/2 | 31/8 | 4 | 7/8 |
| 1 | 18 " 20 | 29.00 | 1434 | 277/8 | 9 | 17/8 | 22 | 31/8 | 4 | 78 |
| | 22 " 24 | 31.00 | 1434 | 3014 | 91/2 | 17% | 241/2 | 414 | 4 | 1 8 |
| | 26 " 28 | 33.00 | 1434 | 327/8 | 10 | 477 | 27 | 41/4 | 4 | 1 |
| | 30 " 32 | 35.00 | 143/ | 353/8 | 101/2 | 178 | 291/2 | 41/4 | 4 | î |
| | 00 02 | | 1434 | 37 | 101/2 | 177 | 311/4 | 41/4 | 4 | 1 |
| 2057 | 0.1 | 40.00 | | 097/ | | 17/8 | | 017 | | 7/6 |
| 35% | 11 10 | 27.50 | 153/4 | 237/8 | 8 | 17/8 | 18 | 31/8 | 4 | 78 |
| | 11 10 | 29.50 | $15\frac{3}{4}$ | 251/4 | 81/2 | 17/8 17/8 | 191/2 | 31/8 | 4 | |
| | 18 " 20 | 33.00 | $15\frac{3}{4}$ | 277/8 | 9 | 1/8 | 22 | 31/8 | 4 | 7/8 |
| | 22 " 24 | 34.50 | $15\frac{3}{4}$ | 301/4 | 91/2 | 1/0 | 241/2 | 41/4 | 4 | 1 |
| | 26 " 28 | 36.00 | $15\frac{3}{4}$ | 327/8 | 10 | 1 1/0 | 27 | 41/4 | 4 | 1 |
| | 30 " 32 | 37.50 | 153/4 | 353/8 | 101/2 | 11/0 | 291/2 | 41/4 | 4 | 1 |
| | 34 " 36 | 42.50 | 153/4 | 37 | 101/2 | 11/0 | 3114 | 414 | 4 | 1 |
| 43/16 | 11 " 13 | 31.00 | 1634 | 243/8 | 9 | 21/6 | 19 | 37/8 | * 4 | 1 |
| | 14 " 16 | 33.50 | 1634 | 267/2 | 91/2 | 21/6 | 205/8 | 4 | 4 | 1 |
| | 18 " 20 | 37.00 | 1634 | $29\frac{3}{8}$ | 10 | 21/6 | 231/4 | 41/2 | 4 | 1 |
| | 22 " 24 | 39.00 | 163/ | 32 | 101/2 | 21/6 | 255/8 | 41/2 | 4 | 1 |
| | 26 " 28 | 41.00 | 1634 | 343/8 | 11 | 21/6 | 28 | 4 ¹⁵ / ₁₆ 4 ⁷ / ₈ | 4 | 1 |
| | 30 " 32 | 43.00 | 1634 | 37 | 111/2 | 21/8 | 303/4 | 47% | 4 | 1 |
| 47/6 | 11 " 13 | 34.00 | 1734 | 9436 | 9 | 21/8 | 19 | 37/8 | 4 | 1 |
| *>10 | 14 " 16 | 37.00 | 1734 | 267/8 | 91/2 | 21/8 | 205/8 | 4 | 4 | î |
| | 18 " 20 | 40.00 | 1734 | 293/8 | 10 | 21/8 | 2314 | 41/2 | 4 | 1 |
| | 22 " 24 | 43.00 | 1734 | 32 | 101/2 | 21/8 | 255/8 | 41/2 | 4 | î |
| | 26 " 28 | 46.00 | 1734 | 343/8 | 11 | 21/8 | 28 | 115/ | 4 | 1 |
| | 20 20 | | | | 111/6 | 21/8 | 303/4 | 4 ¹⁵ / ₁₆ 4 ⁷ / ₈ | 4 | 1 |
| 4117 | 00 02 | 50.00 | 173/4 | 37 | 03/ | 23/8 | 223/4 | 27/ | | |
| 411/16 | 11 10 | 37.00 | 1834 | 263/8 | 934 | 23/8 | 22% | 37/8 | 4 | 11/4 |
| | 14 10 | 40.00 | 1834 | 29 | 101/2 | 20/8 | 225/8 | 434 | 4 | 11/4 |
| | 18 " 20 | 43.00 | 1834 | 311/4 | 101/2 | 23/8 | 2434 | 434 | 4 | 11/4 |
| | 22 " 24 | 46.00 | 1834 | 34 | 111/2 | 23/8 | 273/8 | 43/4 | 4 | 11/4 |
| | 26 " 28 | 49.00 | $18\frac{3}{4}$ | $36\frac{1}{2}$ | 12 | 23/8 | 30 | 5 | 4 | 11/4 |
| 700 | 30 " 32 | 51.00 | 183/4 | 39 | 121/2 | 23/8 | 323/4 | 51/8 | 4 | 11/4 |
| 415/6 | 11 " 13 | 40.00 | 1934 | 263/8 | 934 | 2.3/6 | 223/ | 37/8 | 4 | 11/4 |
| - | 14 " 16 | 43.00 | 1934 | 29 | 101/2 | 23/0 | 225% | 43/4 | 4 | 11/4 |
| | 18 " 20 | 47.00 | 1934 | 311/4 | | 23/8 | 2434 | 43/4 | 4 | 114 |
| | 22 " 24 | 51.00 | 1934 | 34 | $10\frac{1}{2}$ $11\frac{1}{2}$ | 23/6 | 273/8 | 434 | 4 | 114 |
| - | 26 " 28 | 55.00 | 1934 | 361/2 | 12 | 23/8 | 30 | 5 | 4 | 114 |
| | 30 " 32 | 60.00 | 1934 | 39 | 121/2 | 23/8 | 323/4 | 51/8 | 4 | 114 |
| | 00 04 | 1 00.00 | 10/4 | 00 | 1472 | -/8 | 0474 | 0/8 | | 1/4 |

BOND UNIVERSAL POST HANGERS AND PILLOW BLOCKS

RING OILING

ADJUSTABLE BALL AND SOCKET, BABBITTED AND REAMED BEARINGS POST HANGER PILLOW BLOCK



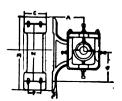






Fig. 8069A

POST HANGERS

Fig. 8069B

| | | | | 031 117 | THAL | | | | | |
|---------------------------------------|-------|-------|-------|----------|----------|-----------|--------|-------|-----|------|
| Sizeof | Price | | GE | NERAL DI | MENSIONS | s, Inches | 3 | | В | OLTS |
| Shaft Inches | Each | A | В | C | D | Е | F | G | No. | Size |
| 13/16 | 4.25 | 7 | 133/4 | 45/8 | 11/8 | 91/2 | | 53/4 | 2 | 5/8 |
| 17/16 | 5.25 | 7 | 133/4 | 45/8 | 11/8 | 91/2 | | 53/4 | 2 | 2/8 |
| 11/16 | 6.00 | 7 | 16 | 51/2 | 13/6 | 12 | | 71/4 | 2 | 5/8 |
| 115/6 | 7.00 | 7 | 16 | 51/2 | 13/16 | 12 | | 71/4 | 2 | 5/8 |
| 23/6 | 8.75 | 7 | 173/4 | 51/2 | 13/8 | 131/4 | | 73% | 2 | 3/1 |
| $\frac{2\frac{3}{16}}{2\frac{7}{16}}$ | 10.25 | 7 | 1734 | 51/5 | 13/8 | 1314 | | 73/8 | 2 | 3/4 |
| 211/16 | 13.50 | 7 | 20 | 61/4 | 134 | 1334 | | 8 | 2 | 1 |
| 215/16 | 15.50 | 7 | 20 | 61/4 | 13/4 | 133/4 | | 8. | 2 | 1 |
| 3%6 | 19.00 | 81/2 | 241/2 | 65/8 | 113/16 | 19 | | 103/4 | 2 | 11/8 |
| 37/6 | 22.50 | 81/2 | 241/2 | 65/8 | 113/16 | 19 | | 103/4 | 2 | 11/8 |
| 311/16 | 28.00 | 934 | 27 | 81/8 | 115/16 | 21 | 31/8 | 12 | 4 | 7/8 |
| 315/16 | 33.50 | 934 | 27 | 81/8 | 115/6 | 21 | 31/8 | 12 | 4 | 7/6 |
| 43/16 | 40.00 | 111/8 | 291/2 | 9 | 236 | 23 | 37/8 | 123/4 | 4 | 1 |
| 47/6 | 46.00 | 111/8 | 291/2 | 9 | 23/6 | 23 | . 37/8 | 1234 | 4 | 1 |
| 47/16 411/16 | 51.00 | 1234 | 321/2 | 10 | 21/4 | 253/4 | 4 | 141/4 | 4 | 11/4 |
| 415/6 | 56.00 | 1234 | 321/2 | 10 | 21/4 | 2534 | 4 | 141/4 | 4 | 11/ |

PILLOW BLOCKS

| Size of | Delas | | GE | NERAL DI | MENSIONS | , Inches | 3 | | В | OLTS |
|--|---------------|-------|-------|----------------|----------|----------|------|-------|-----|---------------------------------|
| Shaft Inches | Price Each | A | В | C | D | Е | F | н | No. | Size Inches |
| 13/16 | 4.00 | 61/2 | 121/4 | 3 | 1 | 87/8 | | 10516 | 2 | 5/8 |
| 17/6 | 5.00 | 61/2 | 1214 | 3 | 1 | 87/8 | | 10% | 2 | 5/8 |
| 17/6 | 5.50 | 714 | 14 | 4!4 | 11/8 | 101/4 | | 1114 | 2 | 5/8 |
| 113/6 | 6.50 | 71/4 | 14 | 414 | 11/8 | 101/4 | | 1114 | 2 | 5/8 5/8 5/8 3/4 3/4 |
| 236 | 8.00 | 75 8 | 1434 | 41/2 | 13/6 | 103/4 | | 121/8 | 2 | 3/4 |
| 21/6 | 9.50 | 75 % | 1434 | 41/2 | 13/6 | 103/4 | | 121/8 | 2 | 3/4 |
| 211/4 | 11.50 | 83/8 | 16 | $5\frac{1}{2}$ | 13/8 | 111/2 | | 131/4 | 2 | 1 |
| 215/16 33/16 37/16 311/16 | 13.50 | 83/8 | 16 | 51/2 | 13/8 | 111/2 | | 131/4 | 2 | 1 |
| 33/6 | 16.75 | 121/2 | 21 | 7 | • 13/4 | 153/4 | | 18 | 2 | 11/8 |
| 31/6 | 20.00 | 121/2 | 21 | 7 | 13/4 | 153/4 | | 18 | 2 | 11/8 7/8 7/8 |
| 311/6 | 24.50 | 12 | 24 | 814 | 115/6 | 1734 | 31/8 | 1914 | 4 | 1 1/8 |
| 315/6 | 29.00 | 12 | 24 | 81/4 | 11/16 | 1734 | 31% | 1914 | 4 | 1/8 |
| 43/6 | 33.00 | 131/4 | 25 | 918 | 2 | 19 | 4 | 221/4 | 4 | 1 |
| 3 ¹⁵ 16 4 ³ 16 4 ⁷ 16 | 37.00 | 1314 | 25 | 91/8 | 2 | 19 | 4 | 221/4 | 4 | 1 |
| 41/6 | 41.00 | 131/2 | 291/4 | 10 | 21/2 | 223/4 | 4 | 23 | 4 | 11/4 |
| 41% | 46.00 | 131/2 | 291/4 | 10 | 21/2 | 223/4 | 4 | 23 | 4 | 11/4 |

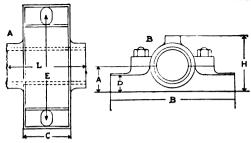
BOND BEARING BOXES

BABBITTED AND REAMED BEARINGS



Fig. 8076A





CLAMP BOXES

| Size of Shaft | Price | | GENERAL DIMENSIONS, INCHES | | | | | | | | |
|------------------|-------|------------------|----------------------------|-----------------|-------|-----------------|--------------------|-----------------|----------|----------------|--|
| Inches | Each | A | ь | C | D | E | н | L | Number | Sise, Ins. | |
| 15/6 | 1.25 | 1 | 53/8 | 2 | 13,16 | 41/4 | 214 | 27/8 | 2 | 3/8 | |
| 13 16 13 16 | 1.50 | 15/6 | $6\frac{3}{4}$ | 23% | 1 | $5\frac{7}{16}$ | 278 | $3\frac{3}{4}$ | 2 | 3/8 | |
| 1516 | 1.75 | $1\frac{1}{2}$ | 716 | $2^5 m s$ | 116 | 6 | 33/16 | 43/16 | 2 | 1/2 | |
| 17/6 | 2.25 | 11/2 | 71/2 | 25% | 116 | 6 | 33/6 | 43/6 | 2 | 1/2 | |
| 111/16 | 2.75 | 1 ⁵ 8 | 7916 | 3 | 116 | 614 | 3% | 415 | 2 | 1/4 | |
| 1156 | 3.50 | 111/16 | 8 | 33/6 | 118 | $63\frac{7}{4}$ | 378 | $5\frac{1}{2}$ | 2 | 1/2 | |
| 23/6 | 4.00 | 23/16 | 938 | 35 % | 13/16 | 758 | 458 | 6^{1} | 2 | 5 _R | |
| 276 | 4.75 | $2\frac{1}{6}$ | 934 | 41g | 114 | 81/8 | 415 | $6\frac{3}{4}$ | 2 | 5/8 | |
| 2117 | 5.75 | 29/16 | 1011 | 41/2 | 138 | 812 | 5516 | 73% | 2 | 5,8 | |
| 2^{15} | 7.00 | 213. | 103 | 5 | 17/6 | 9 ~ | $5\frac{3}{4}$ | . 8 | 2 | 5% | |
| 33% | 9.50 | 25% | 12 | 5 | 1116 | 9 | 5^{78} | 93/4 | 2 | 3/4 | |
| 376 | 11.00 | 258 | 13 | 5 | 1116 | 934 | 6 | 103/4 | 2 | 34 | |
| 31176 | 13.00 | 3 | 14 | $5\frac{5}{16}$ | 114 | 10!4 | 61.4 | 111/3 | 2 | 1/2 | |
| 315 | 16.50 | 3 | 15^{1}_{2} | $6\frac{1}{4}$ | 15/8 | 11^{5}_{8} | $6^{3}\frac{3}{8}$ | $12\frac{1}{2}$ | . 2 | 1 1 | |

Intermediate sizes charged at next larger diameter. Sizes from $\frac{7}{16}$ to $\frac{7}{8}$ -inch also furnished. These sizes are plain bored, not babbitted.

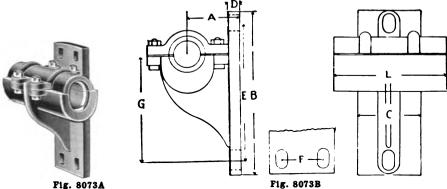
| | | | | FLAT | BOXES | S | | | | |
|--|--|--|--|---|--|--|--|---|---|---|
| 15/16 13/16 17/16 11/16 11/16 23/16 27/2 | 1.00 1.20 1.60 2.20 2.90 3.70 4.25 | $ \begin{array}{c} 1\frac{1}{8} \\ 1\frac{1}{8} \\ 1\frac{1}{8} \\ 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{3}{4} \\ 2 \end{array} $ | 53/8 6 7 71/4 71/2 91/8 | 2 2 2 ¹ / ₄ 2 ⁵ / ₈ 2 ⁷ / ₈ 3 ¹ / ₄ 3 ¹ / ₉ | 7/8 7/8 7/8 1 11/8 11/8 | $4\frac{1}{8}$ $4\frac{3}{4}$ $5\frac{1}{2}$ $5\frac{3}{4}$ $6\frac{1}{8}$ $7\frac{3}{8}$ $7\frac{3}{4}$ | 2 ³ / ₈ 2 ³ / ₈ 2 ⁵ / ₈ 3 ¹ / ₄ 3 ³ / ₈ 3 ⁷ / ₈ | $2\frac{3}{4}$ $3\frac{3}{8}$ $3\frac{7}{8}$ $4\frac{1}{2}$ $4\frac{3}{4}$ $5\frac{1}{2}$ 6 | 2 2 2 2 2 2 2 2 2 | 3/8 3/8 1/2 1/2 1/2 5/8 5/6 |
| 211/16 215/16 | 5,40 6.00 | $\frac{21/8}{21/4}$ | 93 ₄ 10 | 33/4 41/8 | $\frac{11_{4}}{13_{8}}$ | 7½ 8¼ 8¼ | 41/2 47/8 | 61/2 | $\frac{2}{2}$ | 5/8 5/8 |

Sizes from 1/2 to 7/8-inch inclusive also furnished. These sizes are plain bored, not babbitted.



BOND POST AND CLAMP BOXES

BABBITTED AND REAMED BEARINGS RIGID RING OILING POST BOXES



| | 115. 001. | J.A. | | | | | | | | | | | |
|-------------|-----------|------|----------------------------|---------------------|-------|-----------------|---------|-----------------|-------------|----------|------------|--|--|
| Size of | Price | | General Dimensions, Inches | | | | | | | | Вогтя | | |
| Shaft, Ins. | Each | A | В | c | D | E | F | G | L | No. | Size, Ins. | | |
| 136 | 4.00 | 4 | 10 | 25 8 | 5 8 | 818 | | 6 2 | 5^{1}_{2} | 2 | 1/2 | | |
| 17% | 5.00 | 4 | 10^{1} | $27\mathrm{s}$ | . 5 % | 8^{1}_{2} | | 718 | 615 | 2 | 1.2 | | |
| 1116 | 5.75 | 4 | 111/8 | 31.3 | 5 8 | 9 | | 75 ₈ | 71/2 | 2 | 1,7 | | |
| 1156 | 6.75 | 4 | 11^{3}_{4} | 3^{3}_{8} | 5 S | $\mathbf{97_8}$ | | 8316 | 83 8 | 2 | 5 8 | | |
| 236 | 8.50 | 4 | 12^{1}_{2} | 4 | 34 | 10^{3}_{8} | • • • • | 81_{2} | 914 | 2 | · 5/8 | | |
| 276 | 10.00 | 4 | $13^{5_{8}}$ | 5 | 34 | . 11 | • • • • | 83_{4} | 1014 | 2 | 5/8 | | |
| 2"16 | 13.00 | 4 | $14\frac{3}{4}$ | 61_{8} | 1 | 12 | 31/2 | 10 | 11 | 4 | 58 | | |
| 2^{15} | 15.00 | 6 | 15^{3}_{8} | $65\frac{\circ}{8}$ | 1 | 13 | 4 | 11 | 12 | 4 | 1 5 % | | |
| 3316 | 18.50 | 6 | 16^{1}_{2} | 7 ~ | 1 | $13^{3}4$ | 414 | $11^{3}4$ | 13 | 4 | 5 8 | | |
| 377 | 22 00 | 6 | 173 7 | 73 3 | 1 | 1413 | 415 | 124 | . 14 | 4 | 5,3 | | |

POST CLAMP BOX



Fig. 8073C

VERTICAL SHAFT CLAMP BOX



Fig. 8073D

| | POST | CLAMP BO | XES | | |
|---------------|-------------|-----------------|-------------|------|-------------|
| Size of Shaft | inches 13/6 | 17/6 111/6 | 115/ 23/6 | 27/6 | 211/6 215/6 |
| Price | each 3.50 | 3.70 ± 4.00 | 5.10 6.15 | 7.00 | 8.50 10.15 |
| | VERTICAL SH | AFT CLAN | P BOXES_ | | |
| Size of Shaft | inches | 176 116 | 156 236 | 27/6 | 211/6 215/6 |
| Price | | | | | |

BOND PILLOW BLOCKS

BABBITTED AND REAMED BEARINGS

RIGID, RING OILING

HEAVY, RIGID



Fig. 8075A



Fig. 8075B

RIGID, RING OILING

| Size of Shaft | Price | | | GENER | al Dimi | ENSIONS, | INCHES | | | Во | LTS |
|------------------|-------|------|-----------------|----------------|-----------------|----------------------|----------------|----------------|---------------------|--------|------------|
| Inches | Each | A | В | C | D | E | F | H | L | Number | Size, Ins. |
| 13/6 | 3.75 | 134 | 812 | 2 | 1 | 612 | | $\overline{3}$ | 5^{L_2} | 2 | 1/2 |
| 176 | 4.65 | 118 | 9 | 25 g | 116 | 714 | | 314 | $6^{1}\frac{7}{2}$ | 2 | 13 |
| 111 | 5.25 | 21/8 | 9 | 3 | 11/8 | 714 | • • • • | 35 8 | 71 6 | 2 | 1/2 |
| 11/8 | 6.00 | 23.8 | 91/2 | 35/6 | 11% | 71/2 | ••• | 4 | 83.8 | 2 | 5/8 |
| 23/6 | 7.00 | 212 | 105% | 37/8 | 11/4 | 75% | | 41 2 | 91/4 | 2 | 5 8 |
| $2\frac{7}{16}$ | 8.00 | 334 | $113\mathrm{s}$ | 43.8 | $13\frac{1}{8}$ | 814 | | 412 | 101/4 | 2 | 3/4 |
| 214 | 9.25 | | 115 % | 45 8 | $1\frac{1}{2}$ | 83/8 | • • • • | 5 | 11 | 2 | 3/4 |
| $2\frac{15}{6}$ | 10.40 | 316 | 117/8 | 518 | $1\frac{1}{2}$ | 914 | 316 | 51_2 | 12 | 4 | 5 8 |
| 33/6 | 12.00 | 4 | 133/8 | $6\frac{1}{2}$ | 13/4 | 1012 | 4 | 7 | 131/4 | 4 | 5/8 |
| $3\frac{7}{16}$ | 15.00 | 414 | 141/4 | 73/8 | 17/8 | $ 111\frac{7}{2} $ | 434 | 71.2 | 14 | 4 | 5.8 |
| 3 | 18.00 | 41/2 | 151.2 | 71/2 | 2 | 123/8 | 434 | 8 | 15 | 4 | 3/4 |
| 318 | 22.00 | 41/2 | 16 | 8 | 21/8 | 13 | 514 | 8 | 155 8 | 4 | 3/4 |
| 43/6 | 26.50 | 5 | 175% | 81/2 | 23/6 | 14 | 55 3 | 9 | 1712 | 4 | 34 |
| 4 7 6 | 30.00 | 5 | 175 8 | $8\frac{1}{2}$ | 23/6 | 14 | 55% | 9 | $17^{1\frac{7}{2}}$ | 4 | 34 |
| 4 1 | 35.00 | 51/2 | 1814 | 9 | 214 | 1434 | $6\frac{1}{4}$ | 95 g | 193 m s | 4 | 3/4 3/4 |
| 4 [8 | 40.00 | 51 2 | 181/4 | 9 | 214 | 1434 | 61/4 | 95 8 | 193 × | 4 | 3/4 |

HEAVY, RIGID

| Size of Shaft | Price | | General Dimensions, Inches | | | | | | | | | |
|------------------|-------|------|----------------------------|-------------------------|-------------|-------------------|---------------------------|-----------------|----------|--------|----------------|--|
| Inches | Each | A | В | C | D | Е | F | H | L | Number | Size, Ins. | |
| 13/6 | 2.60 | 11/4 | 8 | 2 | 3/4 | 61/4 | | 3,8 | 35 8 | 2 | 1., | |
| 15/16 | 3.00 | 11/4 | 8 | $2^{5}\hat{\mathbf{s}}$ | 3/4 | 61/4 | | 318 | 35% | 2 | 13 | |
| 1_{16}^{1} | 3.75 | 1,8 | 87 8 | 33 s | 13 | 7 | | $3\frac{3}{4}$ | 37% | 2 | $1\frac{5}{2}$ | |
| 1 | 4.75 | 113 | 93 8 | 4 | 7/8 | 71_{2} | | 4 16 | 514 | 2 | 1.7_{2} | |
| 1 } | 5.50 | 1 18 | 11^{1} | 43/4 | 7/8 | 81.2 | | 45 8 | 6 | 2 | 5/8 | |
| 23/6 | 6.25 | 214 | $117\frac{1}{8}$ | 4 18 | 1 | 91/4 | | 5 | 67_{8} | 2 | 3/4 | |
| $2\frac{7}{16}$ | 7.25 | 276 | 12^{1}_{2} | 51/2 | 11/8 | 934 | | $5\frac{7}{16}$ | 71/2 | 2 | 34 | |
| 211 | 8.75 | 212 | 13 | 55.8 | 114 | 103/6 | • • • • | 55% | 81 8 | 2 | 34 | |
| 214 | 10.00 | 213 | 135 ś | 6 | 11/4 | 10 3 | | $6\frac{1}{8}$ | 9316 | 2 | 34 | |
| 33/6 | 12.50 | 3 | 1438 | 61 2 | 13 8 | 1134 | | 65 8 | 911 | 2 | 1 | |
| $3\frac{7}{16}$ | 15.25 | 314 | 15 | 85 g | 1^3 s | 12) 8 | 5,4 | 718 | 1012 | 4 | 34 | |
| 3 įį | 17.00 | 31 N | 1514 | 93 8 | 1^3 s | 12^3 $_8$ | 6'8 | 73 % | 1118 | 4 | 34 | |
| 3}} | 19.50 | 3,8 | 1534 | 10 | 176 | $\mid 127_8 \mid$ | 6^{1} $\stackrel{.}{2}$ | 77.8 | 1134 | 4 | 34 | |
| 43/6 | 22.50 | 334 | 1612 | 1016 | 1^{1}_{2} | 135_{8} | 67 ± 6 | 814 | 125 8 | 4 | 34 | |
| 4 16 | 26.50 | 4 | 167 8 | 1114 | 1% | 14 | 71/8 | 8 11 | 133 8 | 4 | 34 | |
| 4 į ž | 31.00 | 43/6 | 175 8 | $117\frac{7}{8}$ | 116 | 145 8 | 75 8 | 9., | 14 | 4 | 3 7 | |
| 4 8 | 35.00 | 43 8 | 1778 | 127 8 | 1 1 1 | 15 | 85/6 | $9\frac{1}{2}$ | 143/4 | 4 | 34 | |

Intermediate sizes charged at next larger diameter.

DODGE COUNTERSHAFT FIXTURES AND VERTICAL BEARINGS

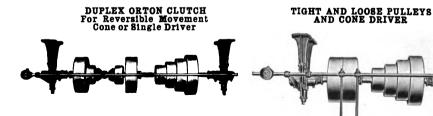


Fig. 9687A

COUNTERSHAFT FIXTURES

| Size, Inches | Price Complete without Arms | Price Complete | Size, Inches | Price Complete without Arms | Price Complete |
|--------------|--------------------------------|----------------|--------------|--------------------------------|----------------|
| | 3.40 3.65 | 4.20 4.80 | 12 16 | $\frac{4.05}{4.35}$ | 5.40 6.20 |

A set of fixtures consists of two shifter arms, two shifter-arm bolts, two fingers with set screws, one 4-foot shifter rod, two shifter-rod collars with set screws and one clamp with set screw.

Additional shifter rod, 40 cents per foot list.

BEARINGS





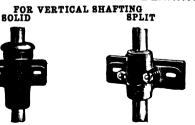


Fig. 9687D

STANDARD ÚSTABLE STEP

I ... 9637D



Flg. 9687E

BEARINGS FOR VERTICAL SHAFTING

| Shaftinches | 17/6 | 111/16 | 111/6 | 23/16 | 27/6 | 2^{11} 16 | 215/6 | 33/16 | 37/6 | 315/6 |
|-------------------|------|--------|-------|-------|------|-------------|-------|-------|-------|-------|
| Price, Solid each | 2.50 | 2.85 | 3.80 | 5.15 | 6.20 | 7.30 | 8.95 | 10.20 | 13.00 | 16.40 |
| " Split " | 3.25 | 3.75 | 5.00 | 6.25 | 7.50 | 9.00 | 11.25 | 13.00 | 16.00 | 22.00 |

At the top of bearing there is a grease pocket wherein the oiling compound is packed. Furnished with solid body or with removable cap, as ordered, babbitted and bored; are adapted to any kind of vertical shaft work.

ADJUSTABLE STEP BEARINGS

| Shaftinches | 13/6 17/6 | 111/16 115/16 | 23/6 27/6 | 211/6 21 | $\frac{1}{16} \frac{3^3}{16} \frac{3}{16} $ | 376 3116 | 31/16 47/16 |
|---------------------|-------------|---------------|-----------|----------|--|----------|-------------|
| Price Standard each | | | | | | | |

This bearing, Fig. 9687E, is adjustable in all directions, is strong and well made. It is equipped with a tempered steel button and brass bushing, surrounded by an oil reservoir of ample capacity, and operates with a minimum frictional loss.



DODGE FLOOR STANDS

ADJUSTABLE, BALL AND SOCKET







FIG. 9356A FIG. 9356B
BOX TYPE WITH RING OR CHAIN SELF-OILING BEARINGS

| Base to Shaft Centerinches | 24 30 | | | | | | | |
|----------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Shaftinches | 33/6 | 31/16 | 311/6 | 35% | 33/6 | 37/6 | 311/6 | 315/16 |
| Priceeach | 63.00 | 66.00 | 69.00 | 72.00 | 90.00 | 93.00 | 96.00 | 99.00 |
| Base to Shaft Centerinches | 36 | | | | 42 | | | |
| Shaftinches | | | 311/6 | | 33/16 | 37/16 | 31/6 | 315/6 |
| Priceeach | 98.00 | 101.00 | 104.00 | 107.00 | 116.00 | 119.00 | 122.00 | 125.00 |
| Base to Shaft Centerinches | | 2 | 24 | | 30 | | | |
| Shaftinches | | | 411/6 | | 43/16 | 47/16 | | 415/6 |
| Priceeach | 80.00 | 84.00 | 88.00 | 93.00 | 120.00 | 124.00 | 128.00 | 133.00 |
| Base to Shaft Centerinches | | 3 | 86 | | | 4 | 2 | |
| Shaftinches | | | 411/16 | | 43/16 | 47/6 | 411/6 | 415/6 |
| Price each | 139.00 | 143.00 | 147.00 | 152.00 | 159.00 | 163.00 | 167.00 | 172.00 |

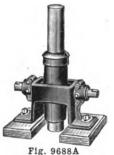
ADJUSTABLE FLOOR STANDS

| | | HEIG | HT FROM BA | SE TO SHAFT CEN | TER | | |
|--------|---------------------|-------------------------------|---------------------|-------------------------------|---------------------|------------------------------|--|
| Shaft | 30 | INCHES | 36 | INCHES | 42 Inches | | |
| Inches | Rigid Price Each | Ball and Socket Price Each | Rigid Price Each | Ball and Socket Price Each | Rigid Price Each | Ball and Socke Price Each | |
| 4 | 85.00 | 95.00 | 95.00 | 102.00 | 105.00 | 110.00 | |
| 41/4 | 85.00 | 95.00 | 95.00 | 102.00 | 105.00 | 110.00 | |
| 41/2 | 85.00 | 95.00 | 95.00 | 102.00 | 105.00 | 110.00 | |
| 5 | 85.00 | 95.00 | 95.00 | 102.00 | 105.00 | 110.00 | |
| 576 | 145.00 | 155.00 | 158.00 | 168.00 | 169.00 | 180.00 | |
| 6 | 145.00 | 155.00 | 158.00 | 168.00 | 169.00 | 180.00 | |
| 61/2 | 145.00 | 155.00 | 158.00 | 168.00 | 169.00 | 180.00 | |
| 7 | 210.00 | 230.00 | 220.00 | 242.00 | 240.00 | 263.00 | |
| 71/2 | 210.00 | 230.00 | 220.00 | 242.00 | 240.00 | 263.00 | |
| 8 | 210.00 | 230.00 | 220.00 | 242.00 | 240.00 | 263.00 | |
| 81/2 | 240.00 | | 254.00 | | 270.00 | | |
| 9 | 240.00 | | 254.00 | | 270.00 | | |
| 91/2 | 260.00 | | 280.00 | | 300.00 | | |
| 10 | 260.00 | | 280.00 | | 300.00 | | |

DODGE ADJUSTABLE VERTICAL SHAFT BEARINGS, BASE PLATES, ETC.

BALL AND SOCKET ADJUSTABLE SPLIT BEARING AND FRAME







First State of State

Fig. 9688A Fig. 9688C BALL AND SOCKET ADJUSTABLE SPLIT BEARINGS AND FRAMES

The lubricating feature of this bearing is same as the solid rigid bearing, the split feature permitting the bearing to be placed on the shaft without disturbing pulleys, couplings, etc., and for use as a floor bearing.

BASE PLATES

| Shaftinches | | | | | | | | | | | |
|-------------------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Price, Plain each | 4.25 | 4.85 | 5.95 | 6.80 | 8.10 | 9.05 | 10.00 | 11.00 | 12.00 | 14.65 | 17.35 |
| " Adjustable " | 6.50 | 7.30 | 8.90 | 10.20 | 12.10 | 13.55 | 15.00 | 16.50 | 18.00 | 22.00 | 26.00 |
| Shaftinches | 415/16 | 5716 | 515/6 | 676 | 615/6 | 71 2 | 8 | 81/2 | 9 | 91/2 | 10 |
| Price, Plain each | | | | | | | | | | | |
| " Adjustable "_ | 31.50 | 35,50 | 39.60 | 42.75 | 45.90 | 49.00 | 54.00 | 59.75 | 65.50 | 69.60 | 73.70 |

The plain type is finished on top and provides for horizontal adjustment only, same being from one to two inches. The adjustable is finished and fitted with a set of wedges operated by set screws. These wedges give a total vertical adjustment of three-quarters of an inch.

Horizontal adjustment is provided for the same as in the plain type.

EXTENSION WALL BRACKETS With Bolt Slot



| Shaft | Wall to Shaft | Price | Shaft | Wall to Shaft | PRICE, EACH | | | |
|---------------------------------|------------------|-------------------|-------------|------------------|--------------|----------|--|--|
| Inches | Center Inches | Each with Slot | Inches | Center Inches | With Slot | Without | | |
| 13/4 to 21/2 | 12 | 8.60 | 334 to 41/2 | 12 | 18.70 | 17.60 | | |
| 134 " 213 | 18 | 11.80 | 334 413 | 18 | 26.20 | 25.80 | | |
| 1^{3}_{4} " 2^{1}_{2} | 24 | 16.60 | 334 " 415 | 24 | 33.60 | 34.20 | | |
| 13, " 215 | 30 | 19.60 | 337 " 413 | 30 | 41.00 | 42.60 | | |
| 134 " 215 | 36 | 24.20 | 33 4413 | 36 | 48.40 | 51.00 | | |
| 234 " 315 | 12 | 13.90 | 434 " 513 | 18 | 30.60 | 31.80 | | |
| 234 " 315 | 18 | 19.90 | 49, " 513 | 24 | 38.60 | 40.00 | | |
| 234 " 315 | 24 | 25.90 | 434 " 515 | 30 | 48.60 | 50.00 | | |
| $2\frac{3}{4}$ " $3\frac{1}{2}$ | 30 | 31.90 | 434 " 51/2 | | | <u> </u> | | |

Fig. 9688D

When it is necessary to locate shafting near a wall, these brackets, in connection with pillow blocks make an excellent support, both horizontal and vertical adjustment being provided. All wall brackets have planed top. Prices without bolt slot on application.

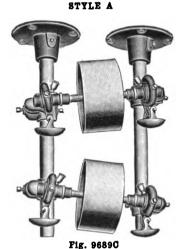
DODGE MULE PULLEY STANDS AND CARRIER FRAMES



ADJUSTABLE







9689B F1g. 9689

STATIONARY MULE STANDS

| Number | 28 | 38 | 48 | 58 | 6S | 78 | 8S | 108 | 128 |
|-------------------------|----------------|-------|-------|-----------|-------|-------|-------|-------|-------|
| Width of Beltinches | 2 | 3 | 4 | ${5}^{-}$ | -6 | 7 | 8 | 10 | 12 |
| Pulleys " | 10x3 | 10x4 | 12x5 | 12x6 | 12x7 | 16x8 | 24×10 | 24x12 | 30x14 |
| Length of Standardfeet | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 |
| " " Guy Rods. " | $5\frac{1}{2}$ | 51/2 | 51.6 | 7 | 7 | 7 | 81/2 | 81/2 | 81/2 |
| " Guy Rods. " Priceeach | 22.50 | 25.00 | 30.00 | 32.00 | 37.50 | 40.00 | 45.00 | 55.00 | 65.00 |

ADJUSTABLE MULE STANDS

| Number | 2A | 3A | 4A | 5 A | 6A | 7A | 8A | 10A | 12A |
|--------------------------|-------------|----------------|-------|------------|-------|-------|-------|--------|----------------|
| Width of Beltinches | $^{-}2^{-}$ | 3 | 4 | -5 | 6 | 7 | 8 | 10 | 12 |
| Pulleys " | 10x3 | 10x4 | 12x5 | 12x6 | 12x7 | 16x8 | 24x10 | 24x12 | 30x14 |
| Length of Standard. feet | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 6 |
| " " Guy Rods " | | $5\frac{1}{2}$ | 513 | 7 | 7 | 7 | 81/2 | 81.2 | 81.5 |
| Priceeach | 56.CO | 58.00 | 60.00 | 65.00 | 70.00 | 75.00 | 85.00 | 115.00 | 150. 00 |

BINDER FRAMES, STYLE A

| Beltinches | 4 | 5 | 6 |
|---------------------|-------|-------|-------|
| Pulleys | 10x6 | 12x7 | 14x8 |
| Price, Completeeach | 55.00 | 65.00 | 75.00 |

BINDER FRAMES, STYLE B, ADJUSTABLE IN ALL DIRECTIONS

| Beltinch | es 8 | 10 | 12 |
|--------------------|-----------|-------|--------|
| Pullevs " | 16x10 | 18x12 | 20x14 |
| Price, Completeeac | h 85.75 | 90.00 | 100.00 |

ALMOND RIGHT ANGLE TRANSMISSION COUPLINGS



Fig. 103A

Fig. 103B

| Number | Diameter of Shaft Inches | Revolutions per Minute | Size of Pulleys Inches | Drop to Center of Shaft Inches | Weight Pounds | Price Each |
|--------|-----------------------------------|------------------------------|------------------------------|---|------------------|---------------|
| 1 | 13/6 | 400 to 500 | 12 x 4 | 7½ | 160 | 55.00 |
| 2 | 17/6 | 300 to 400 | 16 x 6 | 9 | 320 | 83.00 |
| 3 | 115/6 | 250 to 350 | 20 x 9 | 13 | 650 | 165.00 |

Whenever possible, the belting up method of installation is recommended but the coupling can be used under various conditions.

Couplings guaranteed when pulleys and speeds as given in table are used. When Transmission is to be direct-connected, shaft is made to extend 6 inches outside of sleeve and compression shafting coupling supplied in place of pulley.

Standard coupling has two pulleys of the same style, but where desired to operate an individual machine, a wide face pulley may be used on coupling and loose pulley on machine, or tight and loose pulley on coupling, with wide face pulley on line shaft.

Can be adapted for direct-connecting on end of shaft. Can also be used direct-connected with wide face pulley on coupling and tight and loose pulley elsewhere.

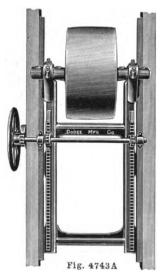
Can also be used direct-connected at both ends, but this is not recommended as alignment must be absolutely perfect, and there is danger of overloading.

Can also be direct-connected at one end with tight and loose pulley on the other quarter. It is self-contained, noiseless and has no gears. Does not throw or spill oil.

Meets all requirements of right angle driving up to the transmitting capacity of a 9-inch belt running on a 20-inch pulley under the proper conditions to insure belt economy.

DODGE BELT TIGHTENERS

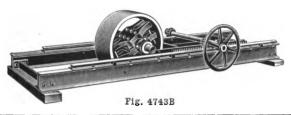
IRON FRAME-Class C



| Number | | | , | | 3-C | 4-C |
|--|-------|-------|-------|-------|--------|-------------|
| Diam. and Face, Pulleyinches Adjustment" | 18 | 20 | 94 | 49. | 48 | 42x38 60 |
| Priceeach | 30.00 | 40.00 | 56.00 | 82.00 | 120.00 | 250.00 |

Furnished with either standard or self-oiling bearings, and iron center wood rim, all wood or all iron pulley. Has rack and pinion adjustment. Hand-wheel can be placed on either side. To be supported between timbers.

IRON FRAME-Class B



| Number | 00-B | 0-B | 1-B | 2-B | 3-B | 4-B |
|---|------|----------------------|-----|-----------------------|-----------------------|-----|
| Diam. and Face Pulleyinches Length of Adjustment" Priceeach | 18 | 18x12 20 50.00 | 24 | 28x20 42 100.00 | 36x28 48 160.00 | 60 |

Furnished with either standard or self-oiling bearings, and iron center wood rim, all wood or all iron pulley. Has rack and pinion adjustment. Hand-wheel can be placed on either side. I-beam base.

PAPER FRICTIONS BEVEL PRICTION WHEEL CUP AND CONE PRICTION





Fig. 5077A

Fig. 5077B

| | | | 18. 0011 | | | | | | | | g. 5077 | | | | |
|--------------------|----------------|--|---|--------------------|----------------|--|--|---------------------|---|--|--|--------------------|----------------|--|--|
| Diameter Inches | Face Inches | Price, Priction Roll or Filler, Each | Price, Friction with Flanges, Each | Diameter Inches | Face Inches | Price, Friction Roll or Filler, Each | Price, Friction with Flanges, Each | Diameter- Inches | Face Inches | Price, Friction Roll or Filler, Each | Price, Friction with Flanges, Each | Diameter Inches | Face Inches | Price, Friction Roll or Filler, Each | Price, Friction with Flanges, Lash |
| 4 | 4 | $\overline{1.12}$ | 2.60 | 11 | 4 | 3.96 | 7.44 | 16 | 5 | 8.34 | 14.58 | 24 | 5 | 14.70 | 30.58 |
| - | 5 | 1.36 | 3.02 | | 5 | 4.80 | 8.56 | | 6 | 9.82 | 16.42 | | 6 | 17.44 | 33.64 |
| | 6 | 1.60 | 3.42 | | 6 | 5.64 | 9.66 | | 7 | 11.28 | 18.24 | | 7 | 20.16 | 36.70 |
| | 7 | 1.84 | 3.84 | | 7 | 6.48 | 10.78 | | 8 | 12.74 | 20.06 | | 8 | 22.88 | 39.74 |
| _ | 8 | 2.08 | 4.26 | il | 8 | 7.32 | 11.88 | | 9 | 14.22 | 22.02 | 1 | 9 | 25.60 | 43.00 |
| 5 | 4 5 | $1.22 \\ 1.50$ | 2.84 3.30 | | 9 10 | 8.16 9.00 | $13.08 \\ 14.20$ | | 10 12 | $15.68 \\ 18.62$ | $23.84 \\ 27.50$ | | 10 12 | 28.32 33.76 | $46.04 \\ 52.14$ |
| | 6 | 1.78 | 3.76 | 1 | 12 | 10.68 | 16.42 | | 14 | 21.54 | 31.44 | | 14 | 39.20 | $52.14 \\ 58.24$ |
| | 7 | 2.04 | 4.20 | 12 | 4 | 4.46 | 8.28 | 17 | 5 | 9.02 | 15.78 | 26 | 5 | 16.68 | 34.68 |
| | 8 | 2.32 | 4.66 | | 5 | 5.42 | 9.50 | | Ğ | 10.62 | 17.74 | | 6 | 19.80 | 38.14 |
| 6 | 4 | 1.48 | 3.28 | | 6 | 6.38 | 10.72 | | 7 | 12.22 | 19.70 | | 7 | 22.90 | 41.56 |
| | 5 | 1.80 | 3.78 | | 7 | 7.34 | 11.96 | | 8 | 13.82 | 21.66 | | 8 | 26.02 | 45.02 |
| | 6 | 2.14 | 4.30 | | 8 | 8.30 | 13.20 | | 9 | 15.42 | 23.74 | | 9 | 29.12 | 48.66 |
| | 7 8 | $2.46 \\ 2.80$ | 4.80 5.32 | | 9 10 | $9.26 \\ 10.22$ | $14.52 \\ 15.74$ | | $\frac{10}{12}$ | $17.02 \\ 20.20$ | $25.70 \\ 29.60$ | | 10 12 | 32.38 38.46 | 52.24 58.98 |
| 7 | 4 | 1.80 | 4.00 | | 12 | $10.22 \\ 12.14$ | 18.20 | | 14 | 20.20 23.40 | 33.30 | | 14 | 44.68 | 65.86 |
| • | 5 | 2.22 | 4.62 | 13 | 4 | 5.32 | 9.70 | 18 | 5 | 9.72 | 16.98 | 28 | 5 | 18.80 | 39.12 |
| Í | 6 | 2.64 | 5.28 | | 5 | 6.40 | 11.08 | | 6 | 11.46 | 19.08 | -0 | 6 | 22.34 | 42.98 |
| | 7 | 3.06 | 5.90 | | 6 | 7.48 | 12.50 | | 7 | 13.20 | 21.18 | | 7 | 25.86 | 46.84 |
| _ | 8 | 3.48 | 6.58 | | 7 | 8.58 | | | 8 | 14.92 | 23.26 | | 8 | 29.40 | 50.70 |
| 8 | 4 | 2.14 | 4.58 | | 8 | 9.66 | 15.30 | | 9 | 16.66 | 25.48 | | 9 | 32.94 | 54.78 |
| | 5 6 | $\begin{vmatrix} 2.64 \\ 3.16 \end{vmatrix}$ | $\begin{array}{c} 5.28 \\ 6.04 \end{array}$ | | 9 10 | $10.74 \\ 11.84$ | $16.78 \\ 18.20$ | 1 | $\begin{array}{c} 10 \\ 12 \end{array}$ | $ 18.40 \\ 21.88$ | $\frac{27.58}{31.78}$ | 1 | 10 12 | $36.46 \\ 43.52$ | 58.64 66.36 |
| | 7 | 3.66 | 6.76 | i i | 12 | 14.00 | 21.00 | | 14 | 25.36 | 35.98 | | 14 | 50.58 | 74.08 |
| l | 8 | 4.18 | 7.52 | 14 | 4 | 5.96 | | 20 | 5 | 11.22 | 21.36 | 30 | 5 | 21.06 | 42.50 |
| 9 | 4 | 2.70 | 5.40 | | $\bar{5}$ | 7.19 | 12.27 | -" | 6 | 13.26 | 23.76 | 00 | 6 | 25.04 | 46.82 |
| | 5 | 3.30 | 6.22 | | 6 | 8.44 | 13.84 | | 7 | 15.30 | 26.16 | 1 | 7 | 29.02 | 51.12 |
| | . 6 | 3.90 | 7.06 | | 7 | 9.68 | 15.38 | | 8 | 17.32 | 28.54 | | 8 | 33.00 | 55.44 |
| | 7 | 4.50 | 7.86 | | 8 | 10.92 | 16.96 | | 9 | 19.36 | 31.06 | | 9 | 36.98 | 59.96 |
| | 8 9 | $5.10 \\ 5.70$ | 8.70 9.54 |]] | 9 10 | 12.16 13.40 | 18.58 20.16 | | 10 12 | $21.40 \\ 25.46$ | $33.46 \\ 38.24$ | | 10 12 | $\frac{40.96}{48.92}$ | 64.26 |
| | 10 | 6.30 | 10.36 | | 12 | $ 13.40 \\ 15.88$ | $20.10 \\ 23.26$ | | 14 | $25.46 \\ 29.54$ | 43.04 | ł | 14 | 56.76 | 73.88 81.38 |
| 10 | 4 | 3.46 | 6.62 | 15 | 4 | 6.32 | 11.10 | $ _{22} $ | 5 | 12.90 | 26,60 | 32 | 5 | 23.48 | 48.44 |
| | 5 | 4.18 | 7.60 | | 5 | 7.68 | 12.76 | | 6 | 15.26 | 29.34 | - | 6 | 27.94 | 53 24 |
| | 6 | 4.90 | 8.60 | | 6 | 9.02 | 14.42 | | 7 | 17.62 | 32.06 | | 7 | 32.40 | 58.02 |
| | 7 | 5.62 | 9.58 | | 7 | 10.38 | 16.08 | | 8 | 19.98 | 34.78 | | 8 | 36.86 | 62.82 |
| | 8 | 6.34 | 10.58 | | 8 | 11.74 | 17.78 | | 9 | 22.36 | 37.66 | | 9 | 41.32 | 67.60 |
| | 9 | 7.06 | 11.66 | | 9 | 13.08 | 19.50 | ıl i | 10 | 24.72 | 40.44 | | 10 | 45.78 | 72.40 |
| | 10 12 | $ 7.78 \\ 9.22$ | $12.64 \\ 14.62$ | il l | 10 12 | $ 14.44 \\ 17.14$ | $21.20 \\ 24.52$ | | 12 14 | 29.44 34.18 | 45.88 51.34 | | 12 14 | 54.68 63.62 | |
| | 14 | | 14.02 | <u> </u> | 14 | 111,14 | | 11 | 14 | JUT. 10 | 01.04 | | 1 14 | 00.02 | 01.00 |

Prices for larger sizes quoted upon application.

DODGE-AMERICAN SYSTEM

ROPE DRIVING

For high efficiency, flexibility and economy in delivering power throughout a plant, this, the "Continuous Wind" system, in which but one rope is used, is the acknowledged standard.

This system may be designed to drive in any direction or angle, permitting when advisable, a detached power house, from which power can be distributed by jack-shaft arrangement to various departments throughout a factory.

Write us for booklet "Twenty-five Years of Rope Driving", an interesting one, which covers this subject very thoroughly.

When asking for plans and estimates, full information is necessary so that we may thoroughly understand the conditions surrounding proposed installation.

As a guide to the furnishing of this data, the following questions should be answered in their respective order and forwarded to us, accompanied by a rough sketch to show all the conditions to be met.

- 1. What is the horse-power required?
- 2. What is the motive power; steam engine, gas engine, water wheel, lineshaft, etc.?
- 3. If steam engine, what type and size?
- 4. If gas engine, what cycle and how many cylinders?
- 5. What is the speed of the driving shaft?
- 6. What is the speed of the driven shaft?
- 7. Are the shafts parallel?
- . 8. Are either or both shafts horizontal or vertical?
 - 9. If both horizontal are they on the same level?
- 10. If not on the same level which is the higher and how much?
- 11. What is the distance on centers of driving and driven shafts?
- 12. What is the largest diameter of wheel that can be placed on driving shaft?
- 13. What is the largest diameter of wheel that can be placed on driven shaft?
- 14. May the ropes run direct between driving and driven sheave, or must they run over, under or around obstructions? Give directions and distances.
- 15. Must the ropes turn any angles? If so, describe them, stating degrees, distances, etc.
 - 16. Will the rope be exposed to the weather or entirely under cover?
 - 17. Where may the tightener and tracks be placed conveniently?
 - 18. What are the directions of motion for driving and driven shafts?
 - 19. Send sketch showing side elevation, also plan of situation.



DODGE-AMERICAN SYSTEM ROPE DRIVING

SHOWING APPLICATION ON LARGE CORLISS ENGINE



Fig. 9604A

In the American system, the tension being regulated automatically, the ropes run without vibration, thus permitting the use of shallow grooves, lighter rope and lighter wheels, a saving in friction and power, over the heavier or English system.

The English system uses separate and independent endless ropes in each groove of the wheel, depending on gravity for tension, and pinched grooves for adhesion. Such a system is only appropriate where conditions are favorable.

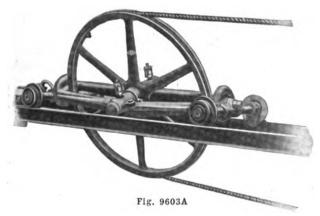
The Dodge American System uses but one continuous rope, winding over the driving and the driven wheels as many times as are required to transmit the required power, the return rope on the slack side forming a loop over the winder and traveling tightener, the tightener being controlled by a weight so that it may automatically regulate the tension of all the wraps of rope. This system was patented in 1885, but has since been greatly improved and made subject of important additional patents.

In the English system a splice is required in every wrap of rope; in the Dodge-American System the rope is one continuous piece, requiring but one splice. The English system depends upon gravity for tension, hence to increase the tension the ropes must be of larger diameter. The slack side of these ropes being loose, they vibrate continuously and have a tendency to jump out of the grooves. To overcome this, deep grooves or high partitions are made in the wheels. These conditions increase the cost of the rope and splicing, and require heavier rims in wheels than in the American system.

For vertical driving, main engine drives, and drives involving distances or angles, the Dodge-American System has many advantages over other modes of power transmission. In general service this system is positive as to delivery of power; it is low in first cost, is noiseless and flexible, and never cumbersome. In transmitting power to detached buildings this system is most efficient and desirable, slippage is practically eliminated, and journal friction reduced to a minimum.

DODGE-AMERICAN SYSTEM ROPE DRIVING

TENSION CARRIAGE, ADJUSTABLE, FOR HORIZONTAL DRIVES



SHOWING APPLICATION

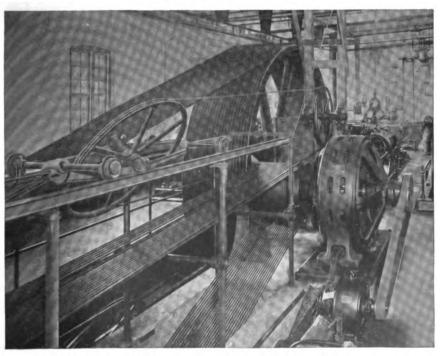


Fig. 9603B

JACK SCREWS

LOCOMOTIVE



Fig. 1022A

TEE TOP



Fig. 1022B

CAR BOX JACK SCREW

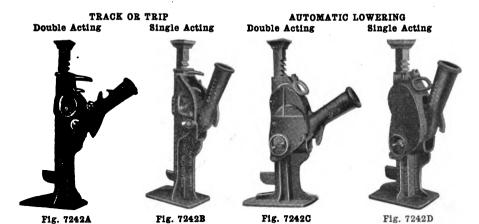


Fig. 1022C

| Capac- ity Tons | Diameter of Screw Inches | Height of Stand Inches | Price Each | Capacity Tons | Diameter of Screw Inches | Height of Stand Inches | Price Each |
|-----------------------|---|------------------------------|---------------|------------------|---------------------------------|------------------------------|---------------|
| 10 | 11/4 | 4 | 2.90 | 24 | 21/4 | 8 | 7.50 |
| 10 | 11/4 | 6 | 3.10 | 24 | $2i_{4}$ | 10 | 8.25 |
| 10 | 11/4 | 8 | 3.40 | 24 | $2i_{4}^{2}$ | 12 | 9.00 |
| 10 | 11/4 | 10 | 3.80 | 24 | $2i_{4}^{2}$ | 14 | 10.00 |
| 10 | 11/4 | 12 | 4.20 | 24 | $2\dot{1}\frac{3}{4}$ | 16 | 11.00 |
| 10 | 114 | 14 | 4.60 | 24 | 214 | 18 | 12.00 |
| 12 | 11/2 | 4 | 3.25 | 24 | $2i_{4}$ | 20 | 13.25 |
| 12 | $\frac{1\frac{1}{2}}{1\frac{1}{2}}$ | 5 | 3.50 | 24 | 214 | 22 | 14.50 |
| 12 | 11/2 | 6 | 3.75 | 24 | $2\frac{1}{4}$ | 24 | 15.75 |
| 12 | 1½ 1½ 1½ 1½ | 8 | 4.25 | 28 | $2\frac{1}{2}$ | 6 | 7.75 |
| 12 | 11/2 | 10 | 4.75 | 28 | $21\sqrt{2}$ | 61/2 | 8.00 |
| 12 | 11/2 | 12 | 5.25 | 28 | $21\frac{7}{2}$ | 8 | 8.75 |
| 12 | 11/3 | 14 | 6.00 | 28 | $2\frac{1}{2}$ | 10 | 9.75 |
| 12 | 11/3 | 16 | 6.75 | 28 | $2\frac{1}{2}$ | 12 | 10.75 |
| 16 | 11/2 11/2 13/4 | 6 | 4.50 | 28 | 21/2 | 14 | 12.00 |
| 16 | 134 | 6 8 | 5.00 | 28 | $2\frac{1}{2}$ | 16 | 13.25 |
| 16 | 134 | 10 | 5.75 | 28 | $2\sqrt{2}$ | 18 | 14.50 |
| 16 | 134 | 12 | 6.25 | 28 | $2\frac{1}{2}$ | 20 | 15.75 |
| 16 | 13/4 | 14 | 6.75 | 28 | $2\frac{1}{2}$ | 22 | 17.00 |
| 16 | 134 | 16 | 7.50 | 28 | $2\frac{1}{2}$ | 24 | 18.25 |
| 16 | 134 | 18 | 8.50 | 28 | $2\frac{1}{2}$ | 26 | 20.00 |
| 20 | 2 | 5 | 5.00 | 1 28 | $2\frac{1}{2}$ | 28 | 22.00 |
| 20 | 2 | 6 | 5.25 | 28 | $2\overline{1/2}$ | 30 | 24.00 |
| 20 | 2 | 6 8 | 6.00 | 28 | 21/2 | 32 | 26.00 |
| 20 | 2 | 10 | 6.75 | 36 | | 14 | 19.50 |
| 20 | 2 | 12 | 7.50 | 36 | 3 | 16 | 20.75 |
| 20 | 2 | 14 | 8.25 | 36 | 3 | 18 | 22.00 |
| 20 | 2 | 16 | 9.25 | 36 | 3 | 20 | 23.25 |
| 20 | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 18 | 10.25 | 36 | 3 3 3 3 3 3 3 | 22 | 24.50 |
| 20 | 2 | 20 | 11.50 | 36 | 3 | 24 | 25.75 |
| 20 | 2 | 22 | 12.50 | 36 | 3 | 26 | 27.00 |
| 20 | 2 | 24 | 13.50 | 36 | 3 | 28 | 28.50 |
| 24 | 21_4 | 6 | 7.00 | 36 | 3 | 30 | 30.00 |

Levers will be sent only when ordered, and will be charged for extra. Tee top jack screws furnished on same list as shown. Car box jack screws, furnished in sizes listed above, at 50 cents advance on list.

BARRETT PATENT LEVER JACKS



TRACK OR TRIP

Track or trip jacks are recommended for track work only. The load can be instantly dropped from any elevation by means of a trip hook which disengages the raising mechanism from the lifting rack. These jacks are positive, speedy and durable.

Double acting jacks raise the load on both the up and down strokes of the lever, the

single acting raises the load on the down stroke only.

DOUBLE 4 0013/0

| | | DOU | RIE VO | TING | | SINGLE ACTING | | | | | | | |
|------|-----------------|------|--------|------------------|---------------|---------------|-----------------|------------------|-----------------|------------------|---------------|--|--|
| No. | Cap'c'y Tons | | | Weight Pounds | Price Each | No. | Cap'c'y Tons | Height Inches | Raise Inches | Weight Pounds | Price Each | | |
| 1 | 10 | 24 | 1315 | 65 | 18,00 | 23 | 4 | 22 | 13 | 39 | 15.00 | | |
| *21 | 10 | 24 | 11 ~ | 65 | 18.00 | 26 | 21/2 | 19 | 10 | 27 | 13.50 | | |
| 12 | 10 | 1734 | 8 | 57 | 17.00 | 17 | 10 | 24 | 13¾ | 65 | 18.00 | | |
| 6 | 15 | 31 | 19 | 110 | 32.00 | 11 | 10 | 171/4 | 8 - | 62 | 17.00 | | |
| **46 | ١ | 28 | 17 | 39 | 20.00 | 20 | 15 | 31 | 19 | 110 | 32.00 | | |

AUTOMATIC LOWERING

Automatic lowering jacks are suitable for all general lifting purposes. The direction, either up or down, is controlled by the eccentric at the side of the frame. These jacks will not trip or drop. They work gradually up and down, can be operated at any angle, and are quick, positive and simple.

| | | DOU | BLE AC | TING | | SINGLE ACTING | | | | | |
|----------|-----------------|------------------|----------------|------------------|---------------|---------------|-----------------|------------------|------|------------------|---------------|
| No. | Cap'e'y Tons | Height Inches | | Weight Pounds | Price Each | No. | Cap'c'y Tons | Height Inches | | Weight Pounds | Price Each |
| 13 | 3 | 14 | $6\frac{1}{2}$ | 29 | 15.00 | 150 | 5 | 16 | 8 | 35 | 16,00 |
| 50 | 5 | 16 | 8 | 35 | 16.00 | 151 | 5 | 21 ` | 13 | 42 | 18.00 |
| 51 | 5 | 21 | 13 | 42 | 18.00 | 18 | 10 | 21 | 10 | 75 | 25.00 |
| 2 | 10 | 21 | 10 | 73 | 25.00 | 19 | 15 | 28 | 171% | 117 | 35.00 |
| *32 | 10 | 20^{1}_{2} | 10 | 75 | 25.00 | 39 | 15 | 22 | 1112 | 106 | 30.00 |
| 3 | 12 | $26\frac{1}{2}$ | 15 | 95 | 30.00 | 49 | 15 | 35 | 24 5 | 122 | 42.00 |
| 4 | 15 | 22 | 10 | 106 | 35.00 | †48 | 15 | 11 | 5 | 67 | 25.00 |
| 5 | 15 | 28 | 15 | 124 | 40.00 | 1 | l | | l | | |

^{*}Side foot lift. **Logging jack. †Journal jack.

NORTON BALL AND CONE-BEARING RATCHET JACKS

50-TON BRIDGE JACK



Fig. 1026A

STYLE NA AND A



Fig. 1026B

STYLE G With Foot Lift



Fig. 1026C

STYLE NA With Hook



Fig. 1026D



SECTIONAL OF



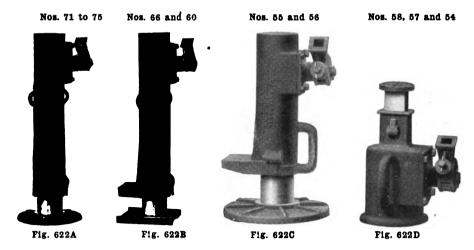
Fig. 1026E

| Style | Height Inches | Rise Inches | Capacity Tons | Size of Base Inches | Diam of Head Inshes | Weight Pounds | Price Each | Price Hook Extra Each |
|--------------|---------------------|----------------|------------------|---------------------------|---------------------------|------------------|----------------|-----------------------------|
|) | 22 | 10 | 15 | 8x8 | 51/2 | 115 | 60.00 | |
| i | 26 | 13 | 25 | 8x9 | 51/2 | 157 | 96.00 | |
| on l | 22 | 10 | 25 | 8x9 | 51/2 | 136 | 90.00 | |
| Bridge Jacks | 22 | 10 | 35 | 8x10 | 61/2 | 190 | 1 30.00 | |
| J. | 26 | 13 | 35 | 8x10 | 61/2 | 230 | 138.00 | |
| 98 | 24 | 9 | 50 | 14 | 101/ | 270 | 150.00 | |
| rid | 27 | 13 | 50 | 14 | 101/2 | 288 | 150.00 | |
| Ä | 27 | 12 | 60 | 14 | 101/2 | 340 | 175.00 | |
| | 1 $\overline{27}$ | 12 | 70 | 14 | 101/2 | 340 | 200.00 | |
| C , | 26 | 13 | 35 | 12 | | 165 | 125 0 0 | 10.00 |
| C | 31 | 18 | 35 | 12 | | 195 | 135.00 | 10.00 |
| CJ | 31 | 16 | 60 | 14 | | 300 | 175.00 | |
| NA | 26 | 13 | 25 | 12 | | 154 | 90.00 | 8.00 |
| NA | 24 | 11 | 25 | 13 | | 148 | 85.00 | 8.00 |
| NA | 20 | 9 | 25 | 10 | l | 106 | 80.00 | 8.00 |
| F | 24 | 12 | 15 | 10 | | 115 | 60.00 | |
| A | 26 | 13 | 15 | 10 | <i></i> | 110 | 70.00 | 8.00 |
| M | 26 | 13 | 15 | 6 x 6 | | 108 | 70.00 | 8.00 |
| В | 22 | 10 | 15 | 10 | | 100 | 60.00 | 8.00 |
| R | 20 | 9 | 15 | 12 | l | 100 | 60.00 | 8.00 |
| BL | 18 | 7 | 15 | 10 | | 95 | 60.00 | 8.00 |
| G | 22 | 10 | 15 | 10 | | 105 | 25.00 | 7.00 |
| *Ğ | 22 | 10 | 15 | 10 | | 110 | 28.00 | |
| †G | 22 | 10 | 15 | 10 | | 110 | 32.00 | |

^{*} Foot Cast on Shell.

[†] With Hook.

DUFF BALL BEARING AND CONE BEARING GEARED RATCHET SCREW JACKS



Nos. 71 to 93 are regularly equipped with improved ball bearings. These tacks contain no foot lift but a claw hook for handling low set loads is supplied extra, these claw hooks lifting the full capacity of the jack. Capacities 15 to 35 tons.

Nos. 66 to 70 Duff jacks are equipped regularly with improved ball bearings. They are useful for any general lifting work, have capacities from 15 to 70 tons, and have various heights. The full load may be easily raised from the top of the jack or one-half the rated capacity, on foot lift.

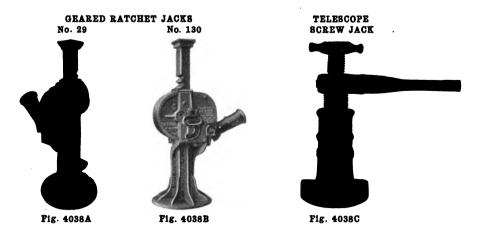
Nos. 55 and 56 are designed for lighter service than the ball bearing jacks, and are particularly adapted to electric and street railway work. They have a lifting capacity of 10 tons and are useful for industrial companies, mills, truckmen, transfer companies, contractors, mining companies, general work, etc.

Nos. 58 to 54 are short lift journal jacks. They are the most powerful, serviceable and economical journal jacks on the market.

| No. | Capac- ity Tons | Helght Inches | Ruise Inches | Weight *Pounds | Price Each | No. | Capacity Tons | Height Inches | Raise Inches | Weight *Pounds | Price Each |
|------|-----------------------|------------------|-----------------|-------------------|---------------|-----|------------------|------------------|-----------------|-------------------|---------------|
| 71 | 15 | 18 | 7 | 99 | 60.00 | 60 | 15 | -26 | 13 | 132 | 70.00 |
| 72 | 15 | . 20 | 9 | 104 | 69.00 | 67 | 25 | 22 | 10 | 167 | 90,00 |
| 73 | 15 | 22 | 10 | 107 | 60.00 | 61 | 25 | ≒ 7 | 13 | . 196 | 96.00 |
| 74 | 15 | 26 | 13 | 115 | 70.00 | 6⊰ | 35 | 22 | 10 | 220 | 130.00 |
| 75 | 15 | 32 | 19 | 137 | 75.00 | 62 | 35 | 26 | 1.3 | 250 | 138.00 |
| 81 | 25 | 20 | 9 | 141 | 60.00 | 64 | 50 | 27 | 13 | 320 | 150.00 |
| 82 | 25 | 24 | 11 | 159 | 85.00 | 65 | 50 | 24 | 9 | 270 | 150.00 |
| 83 | 25 | 26 | 13 | 180 | 90.00 | 69 | 50 | 30 | 5 | 250 | 150,00 |
| · 84 | 25 | 30 | 17 | 200 | 95.00 | 70 | 70 | 27 | 13 | 370 | 200.00 |
| 63 | 25 | 36 | 23 | 230 | 100.00 | 55 | 10 | 14 | 7 | 62 | 22.00 |
| 91 | 35 | 26 | 13 | 205 | 125.00 | 56 | 10 | 20 | 10 | 94 | 24.00 |
| 92 | 35 | 31 | 18 | 220 | 135.00 | 58 | 10 | 11 | 5 | 44 | 20.00 |
| 93 | 35 | 36 | 23 | 240 | 145.00 | 57 | 15 | 9^{3}_{4} | 4 | 47 | 22.00 |
| _ 66 | 15 | 22 | 10 | 120 | 60.00 | 54 | 15 | 11 | 5 | 43 | 22.00 |

^{*}Including lever. Hooks for Nos. 71 and 72, 5,00 each. Nos. 73, 74, 81 and 82, 6,00 each. Nos. 75 and 83, 7,00 each and Nos. 84 and 63, 8,00 each.

DUFF GEARED RATCHET LEVER AND TELESCOPE SCREW JACKS



GEARED RATCHET JACKS

| No. | Capacity Tons | HEIGHT, Bar Down | Inches Bar Raised | Raise of Bar, Inches | Size of Bar Inches | Weight with Lever, Lbs. | Price Each |
|-----|------------------|---------------------|-----------------------|-------------------------|-----------------------|----------------------------|---------------|
| 29 | 25 | 28 | 45 | 17 | 21/2×21/1 | 190 | 95.00 |
| 31 | 35 | 36 | 61 | 25 | 21/2 x3 | 270 | 130.00 |
| 130 | 35 | 28 | 45 | 17 | 21/2x3 | 240 | 120.00 |
| 400 | 40 | 28 | 45 | 17 | $2\sqrt{2}x3$ | 275 | 175.00 |

TELESCOPE SCREW JACKS

These jacks have many advantages over the ordinary screw jack. The load can be ruised twice as rapidly and the jack can be used in close quarters because of the ratchet and handle construction. The height of these jacks when open is more than double their heights when closed.

| No. | Capacity | Неісит | INCHES | DIA. OF SCR | EW, INCHES | Weight | Price |
|-----|----------|--------|--------|-------------|----------------|-----------|-------|
| | Tons | Closed | Open | Large | Small | Pounds | Each |
| 11 | 15 | 8 | 18 | 3 | 2 | 40 | 22.00 |
| 12 | 15 | 10 | 22 | 3 | 2 | 45 | 25.00 |
| 13 | 20 | 13 | 30 | 31/8 | 21/8 | 64 | 30.00 |
| 14 | 25 | 16 | 39 | 314 | 21/4 | 75 | 31.00 |
| 15 | 30 | 16 | 39 | 31/2 | $2\frac{1}{2}$ | 85 | 40.00 |
| 16 | 40 | 19 | 48 | 334 | 23/4 | 127 | 45.00 |

Above jacks made in wrought iron and steel.

No. 29 has a lifting capacity of 25 tons and is convenient for the rapid handling of heavy loads of any character. Easy to operate, convenient to handle, reliable and substantial. No. 31 has a lifting capacity of 35 tons and stands 16 inches higher than No. 29 jack, and is a higher geared ratchet jack. This jack is particularly adapted to the rapid handling of passenger and Pullman coaches, the bodies of which are high. No. 130 is an improved geared ratchet jack of 35 tons capacity. The leverage on this jack is compounded so as to permit ease of operation and quick action.

The No. 400 jack is an improved geared ratchet lever jack of 40 tons capacity, quick acting and designed to handle the heaviest loaded freight cars, passenger or Pullman

coaches, locomotives in round-house, etc.



DUFF-BETHLEHEM HYDRAULIC JACKS

FORGED STEEL

LOW TYPE OR TELESCOPE
Extended Closed

WRECKING







Fig. 748A

Fig. 748B

Fig. 748C

These jacks together with the "plain" "broad base" and "fixed claw" type represent the latest and highest development attained in hydraulic jack construction, and are made in every type, size and capacity for all lifting purposes. They are forged entirely out of steel and are from 30 to 60 per cent lighter weight than many other hydraulic jacks of equal capacity, are very strong, powerful and durable.

LOW TYPE OR TELESCOPE

WRECKING

| No. | Capacity Tons | Runout Inches | *Height Inches | Wt. | Price Each | No. | Capacity Tons | Runout | *Height Inches | Wt. | Price Each |
|------|------------------|------------------|-------------------|-----|---------------|-----|------------------|--------|-------------------|-----|---------------|
| DK | 30 | 12 | 183/4 | 195 | 170.00 | WB | 15 | 12 | 221/2 | 110 | 110 00 |
| DKK | 30 | 18 | 2134 | 200 | 200.00 | | 15 | 18 | 281/2 | 124 | 120.00 |
| DL | 40 | 12 | 1834 | 200 | 200.00 | | 20 | 12 | 231/8 | 126 | 125.00 |
| DLL | 40 | 18 | 213/4 | 220 | 240.00 | | 20 | 18 | 291/4 | 138 | 142.00 |
| DM . | 50 | 12 | 171/4 | 230 | 225.00 | | 30 | 9 | 2114 | 136 | 150.00 |
| DMM | 50 | 18 | 201/4 | 250 | 265.00 | | 30 | 12 | 241/4 | 149 | 170.00 |
| DO | 60 | 12 | 171/2 | 230 | 235.00 | | | 18 | 3014 | 164 | 190.00 |
| DOO | 60 | 18 | 221/2 | 280 | 290.00 | | 40 | 12 | 243/8 | 154 | 200.00 |
| DP | 80 | 9 | 173/8 | 278 | 270.00 | | 40 | 18 | 303/8 | 176 | |
| DPP | 80 | 12 | 187/8 | 340 | 285.00 | | 50 | 12 | 265/8 | 205 | 240.00 |
| DDP | 80 | 18 | 217% | 400 | 340.00 | | 50 | 18 | 200/8 | 220 | 275.00 |
| DS | 100 | 9 | 1734 | 425 | 320.00 | | 60 | 12 | $\frac{337}{8}$ | 248 | 325.00 |
| DSS | 100 | 12 | 1916 | 460 | 340.00 | | 60 | 18 | | | 335.00 |
| DDS | 100 | 18 | 231/2 | 510 | 415.00 | | | | 331/2 | 260 | 400.00 |
| DT | 125 | 12 | 20 | 500 | 400.00 | | | | | | |
| DTT | 125 | 18 | 23 | 560 | 460.00 | | | | | | |
| DV | 150 | 9 | 183/8 | 500 | 430.00 | | | | | | |
| DVV | 150 | 12 | 20 8 | 530 | 450.00 | | | | | | |
| DY | 200 | 9 | 19 | 600 | 490.00 | | | | | | |
| DYY | 200 | 12 | 201/2 | 650 | 520.00 | | | | | | |
| DZ | 250 | 9 | 191/2 | 700 | 610.00 | | | | | | |
| DZZ | 250 | 12 | 21 | 760 | 650.00 | | | | | | |
| DDZ | 250 | 18 | $\frac{21}{24}$ | 950 | 800.00 | | | | | | |
| | - | 10 | 41 | 000 | 000.00 | | | | | | |

^{*}When closed.

TACKLE BLOCKS

Inside Iron Strapped Blocks with Iron Sheaves, Loose Hooks

SINGLE



Fig. 1422A

DOUBLE

Fig. 1422B



Fig. 1432C

| DIMENSIO | DIMENSIONS, INCHES | | | PRICE IRON BUSHED EACH | | | PRICE ROLLER BUSHED EACH | | | PRICE METALINE BUSHED, EACH | | |
|--|--------------------|----------|------------|---------------------------|---------------------|--------------|-----------------------------|--------------|--------|--------------------------------|--------|--|
| Sheaves | Rope | Shell | Single | Double | Triple | Single | Double | Triple | Single | Double | Triple | |
| 134 x ½ x 38 | | 3 | .70 | 1.30 | 1.75 | 1.10 | 2.00 | 2.90 | | | | |
| 2 x ½ x 3/8 | 1/8 | 31/2 | .75 .85 | 1.45 1.60 | $2.00 \\ 2.15$ | 1.15 1.20 | 2.20 2.25 | 3.15 3.25 | 1.50 | 2.90 | 4.15 | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 72 5/ | 4 5 | .90 | 1.75 | $\frac{2.15}{2.25}$ | 1.25 | 2.35 | 3.50 | 1.75 | 3.35 | 4.75 | |
| 3 x 34 x 38 3½ x 1 x ½ | | 6 | 1.10 | 2.00 | 2.90 | 1.50 | 2.85 | 4.40 | 2.20 | 4.00 | 5.80 | |
| $\frac{1}{4}$ x 1 x $\frac{1}{2}$ | | 7 | 1.30 | 2.40 | 3.50 | 1.70 | 3.35 | 5.00 | 2.50 | 4.50 | 6.70 | |
| 3 x 1 1/8 x 5/8 | | 8 | 1.65 | 2.85 | 4.25 | 2.25 | 4.15 | 6.00 | 3.25 | 5.70 | 8.50 | |
| 12 x 118 x 58 | | 9 | 1.85 | 3.40 | 4.75 | 2.50 | 4.70 | 7.25 | 3.70 | 6.75 | 10.00 | |
| 31/4 x 11/4 x 5/8 | | 10 | 2.75 | 4.50 | 6.25 | 3.50 | 6.00 | 8.50 | 4.75 | 8.50 | 12.50 | |
| 14 x 14 x 34 | | 11 | 4.45 | 7.50 | 10.65 | 5.30 | 9.20 | 13.20 | | | | |
| $3 \times 13^{8} \times 3^{4}$ | 114 | 12 | 4.45 | 7.50 | 10.65 | 5.30 | 9.20 | 13.20 | 6.75 | 12.50 | 18.50 | |
| $x 1\frac{1}{2} x \frac{3}{4}$ | | 13 | 7.00 | 10.50 | 15.00 | 8.15 | 12.80 | 18.45 | 9.75 | 17.00 | 25.00 | |
| 1 ₂ x 15 ₈ x 7 ₈ | | 14 | 7.00 | 10.50 | 15.00 | 8.15 | 12.80 | 18.45 | 9.75 | 17.00 | 25.00 | |
| $0 \times 1_{8} \times 7_{8}$ | 11/2 | 15 | 8.00 | 13.00 | 18.00 | 9.25 | 15.50 | 21.75 | | • • • • | | |
| $1 \times 1\frac{3}{4} \times \frac{7}{8}$ | 15/8 | 16 | 10.00 | 15.00 | 22.00 | 11.50 | 18.00 | 26.50 | | | | |

For Blocks with Loose Swivel Hooks, add to List for each Hook

| Single Block inches Double " " Triple " " | | 6 5 | 7 6 5 | 8 7 6 | 9 8 7 | 10 9 8 | 12 10 9 | 13 12 10 | 14 13 12 | 15 14 13 | 16 15 14 |
|---|-----|--------|-------------|-------------|-------------|--------------|---------------|----------------|----------------|----------------|----------------|
| Priceeach | .50 | .50 | .50 | .60 | .75 | .90 | 1.20 | 1.75 | 2.50 | 3.00 | 3.50 |

SNATCH BLOCKS

WOOD SNATCH BLOCK DROP LINK



Fig. 5567A

WOOD SNATCH BLOCK SELF-LOCKING



Fig. 5567B

MALLEABLE IRON SHELL SNATCH BLOCK



Fig. 5567C

WOOD SNATCH BLOCKS

| 120,000,000,000 | Diameter | Length of | | PRICE, EACH | |
|---------------------|--------------|---------------|-------------|---------------|------------------------------|
| Sheave, Inches | Rope, Inches | Shell, Inches | Iron Bushed | Roller Bushed | Metaline or Bronze Bushed |
| 3 x11/8 x 1/2 | 7/8 | 6 | 4.00 | 4.65 | 5.25 |
| 31/4 x 11/4 x 1/4 | 7/8 7/8 | 7 | 4.75 | 5.50 | 6.00 |
| 41% x 13% x 5% | 1 | 8 | 5.75 | 6.60 | 7.25 |
| 5 x 13/8 x 5/8 | 11/8 | 9 | 6.75 | 7.75 | 8.50 |
| 5% x 1% x 34 | 11/4 | 10 | 8.50 | 10.00 | 11.00 |
| 634 x 21/8 x 3/4 | 11% | 12 | 10.00 | 11.50 | 13.00 |
| 8 x 21/4 x 1/8 | 134 | 14 | 13.00 | 15.00 | 16.50 |
| 9 x 25 x 1 | 2 | 16 | 17.00 | 20.00 | 22.00 |
| 10 x3 x1 | 21/4 | 18 | 25.00 | 28.50 | 31.00 |
| 11 x 31/4 x 11/4 | 21/2 | 20 | 38.C0 | 43.00 | 46.00 |
| 1134 x 414 x 11/2 | 3 | 22 | 55.00 | 63.00 | 68.00 |
| 121/2 x 41/2 x 11/2 | 3½ | 24 | 70.00 | 78.00 | 86.00 |

Extra for galvanized hooks and straps.

MALLEABLE IRON SHELL SNATCH BLOCKS

| | | Cl Ch. II | | PRICE EACH | |
|-----------------------|-----------------------------|----------------------|-------------------------|-----------------------|---------------------------------|
| Size Sheave Inches | For Diam. Rope Inches | Size Shell Inches | Star Metaline Bushed | Five-Roller Bushed | Star Pat. Graphite Bushed |
| 3 x 1½ x ½ | 7/8 | 6 | 5,75 | 5,15 | 4.50 |
| 3½ x 1½ x ½ | 7/8 | 7 | 6.75 | 6.25 | 5.50 |
| 41% x 1% x 5% | 1 1 | 8 | 8.00 | 7,35 | 6.50 |
| 5 x 13% x 5% | 11% | 9 | 9.25 | 8.50 | 7.50 |
| 5% x 1% x % | 1)4 | 10 | 12.50 | 11.50 | 10.00 |
| 3% x 21% x 34 | $1\frac{1}{2}$ | 12 | 15.50 | 14.00 | 12.50 |
| 8 x 2 ½ x 7/8 | $1\frac{3}{4}$ | 14 | 19.50 | 18.00 | 16.00 |
| 9 x 2 1 x 1 | 2^{-} | 16 | 26.00 | 24.00 | 21.00 |

TACKLE BLOCKS

MALLEABLE IRON SHELLS-STEEL HOOKS, STRAPS, PINS AND RIVETS

SINGLE



Fig. 5710A

DOUBLE



Fig. 5710B

TRIPLE



Fig. 5710C

REGULAR MORTISE

| Dimensio | Dimensions, Inches | | | Price Plain Bushed Each | | | Price ller Bus Each | hed | Price Phosphor-Bronze Bushed Each | | | |
|------------------------------------|--------------------|--------------------|--------|-------------------------------|--------|--------|---------------------------|--------|---|--------|--------|--|
| Sheave | Diam. Rope | Length of Shell | Single | Double | Triple | Single | Double | Triple | Single | Double | Triple | |
| 21/4 x11/16 | 1/2 | 4 | .90 | 1.75 | 2.50 | 1.30 | 2.50 | 3.60 | 1.65 | 3.25 | 4.75 | |
| $2\frac{3}{4} \times \frac{7}{8}$ | 5 % | 5 | 1.00 | 1.90 | 2.75 | 1.50 | 2.90 | 4.25 | 1.80 | 3.50 | 5.15 | |
| $3\frac{1}{4}\times1$ | 34 | 6 | 1.25 | 2.25 | 3.25 | 1.75 | 3.25 | 4.75 | 2.10 | 4.00 | 5.80 | |
| $4\frac{1}{4} \times 1\frac{1}{8}$ | 3/4 7/8 | 7 | 1.50 | 2.70 | 4.00 | 2.10 | 3.85 | 5.80 | 2.45 | 4.60 | 6.85 | |
| $5x1\frac{1}{4}$ | Ĩ | 8 | 1.85 | 3.20 | 4.75 | 2.55 | 4.60 | 6.85 | 2.90 | 5.30 | 7.90 | |
| $5\frac{1}{2} \times 1\frac{5}{6}$ | 11/6 | 9 | 2.40 | 4.00 | 5.50 | 3.20 | 5.60 | 7.90 | 3.55 | 6.30 | 9.00 | |
| $6\frac{1}{4} \times 1\frac{8}{8}$ | 11/8 | 10 | 3.10 | 5.10 | 7.00 | 4.05 | 7.00 | 9.85 | 4.40 | 7.70 | 11.00 | |
| $7\frac{1}{2} \times 1\frac{1}{2}$ | 111 | 12 | 5.00 | 8.25 | 11.75 | 6.00 | 10.35 | 14.90 | 6.45 | 11.15 | 16.00 | |
| $8\frac{1}{2} \times 1\frac{5}{8}$ | 13/8 | 14 | 7.50 | 11.75 | 16.50 | 8.75 | 14.25 | 20 25 | 9.10 | 15.00 | 21.30 | |

Prices on Regular Mortise Blocks with Ball Bearings on application.

WIDE, MORTISE, HEAVY PURCHASE

| Dimensi | ons, Inc | hes | Pla | Price in Bush Each | ed | | Price sphor-Br shed, Ea | | В | Price all Beari Each | ng |
|-------------------------|-------------------------------------|--------------------|--------|--------------------------|--------|--------|-------------------------------|--------|------------------------|----------------------------|--------|
| Sheaves | | Length of Shell | Single | Double | Triple | Single | Double | Triple | Single | Double | Triple |
| 7½x1¾ 8½x1¾ 10x2¼ | $\frac{1\frac{1}{2}}{1\frac{3}{4}}$ | 12 14 16 | 9.00 | 15.00 | 20.00 | 10.80 | 18.50 | 25.50 | 7.00 10.00 14.00 | 16.50 | 24.00 |

TACKLE AND SNATCH BLOCKS

FOR MANILA ROPE

STEEL TACKLE BLOCKS WITH LOOSE HOOKS Edges Rounded to Protect the Rope DOUBLE







Fig. 7759A

Fig. 7759B

Fig. 7759C

| DIMENSION | DIMENSIONS, INCHES | | | IRON BI | USHED | PRICE, PATENT SIX ROLLER BUSHED, EACH | | | BRONZE | , Еасн | |
|-----------------------------------|--------------------|-------|--------|---------|--------|--|--------|--------|--------|--------|--------|
| Size Sheave | Rope | Shell | Single | Double | Triple | Single | Double | Triple | Single | Double | Triple |
| 21/4x 5/8x 3/8 | 1/2 | 4 | .90 | 1.75 | 2.50 | 1.40 | 2.60 | 3.75 | 1.65 | 3.25 | 4.75 |
| 3 x 3/4 x 3/8 | 1/2 5/8 | 5 | 1.00 | 1.90 | 2.75 | 1.50 | 2.90 | 4.25 | 1.80 | 3.50 | 5.15 |
| $3\frac{1}{2}$ x1 x $\frac{1}{2}$ | 3/4 | 6 | 1.25 | 2.25 | 3.25 | 1.75 | 3.25 | 4.75 | 2.10 | 4.00 | 5.80 |
| 41/4x1 x 1/2 | 7/8 | 7 | 1.50 | 2.70 | 4.00 | 2.10 | 3.85 | 5.80 | 2.45 | 4.60 | 6.85 |
| 43/4 x11/8 x 5/8 | 1 | 8 | 1.85 | 3.20 | 4.75 | 2.55 | 4.60 | 6.85 | 2.90 | 5.30 | 7.90 |
| 61/4 x11/2 x 3/4 | 11/4 | 10 | 3.10 | 5.10 | 7.00 | 4.05 | 7.00 | 9.85 | 4.40 | 7.70 | 11.00 |
| 8 x15/8x 3/4 | 11/2 | 12 | 5.00 | 8.25 | 11.75 | 6.00 | 10.35 | 14.90 | 6.45 | 11.15 | 16.00 |
| 9½x17/8x 7/8 | 13/4 | 14 | 7.50 | 11.75 | 16.50 | 8.75 | 14.25 | 20.25 | 9.10 | 15.00 | 21.30 |
| $11 \times 2\frac{1}{4} \times 1$ | 2 | 16 | 13.00 | | 32.00 | 14.00 | 24.00 | 35.00 | 15.00 | 25.00 | 38.00 |
| 12 x25/8x11/8 | 21/4 | 18 | 22.00 | 35.00 | 50.00 | | | | 25.00 | 41.00 | 59.00 |
| 13½x3 x1¼ | $2\frac{1}{2}$ | 20 | 30.00 | 50.00 | 65.00 | | | | 34.00 | 58.00 | 77.00 |



Fig. 7759D

Sizes 10-inch and larger have the same score as wide mortise wooden blocks and will take the same size rope.

WIRE ROPE SNATCH BLOCKS

| Sheaves Inches | Rope Inches | Price Common Bushed Each | Price Metaline Bushed Each | Price, Graphite Bronze Bushed Each |
|-------------------|----------------|--------------------------------|----------------------------------|--|
| 10 | 5/8 | 16.00 | 18.00 21.00 | 18.00 21.00 |
| 12 14 | 3/4 | 18.00 20.00 | 24.00 | 24.00 |
| 16 18 | 1 7/8 | 28.00 38.00 | 33.00 44.00 | 33.00 |
| 20 | 11/4 | 50.00 | 58.00 | 58.00 |

TACKLE BLOCKS FOR WIRE ROPE

DIAMOND PATTERN

HEAVY WITH LOOSE HOOK HEAVY WITH STIFF SWIVEL HOOK HEAVY WITH SHACKLES







Fig. 1427A

Eta 14071

Fig. 1427C

REGULAR PATTERN WITH LOOSE AND STIFF SWIVEL HOOKS AND SHACKLES

| | | ~!1 | D SIIAU | 'LLO | | | |
|--|-------------------------------|--------|------------|---------|-------------|--------------|------------|
| Dimes | RIONS | PRICE. | Iron Bushe | d, Each | PRICE, GRAI | PHITE BRO ZE | Bush'd,Ea. |
| Sheaves Inches | Diameter Wire Rope, Inches | Single | Double | Triple | Single | Double | Triple |
| 6x1 x 34 | 3 8 | 6.00 | 11.00 | 14.00 | 9.00 | 17.00 | 22.00 |
| $8x1\frac{1}{4}x^{-7}8$ | 1/2 | 8.00 | 13.00 | 16.00 | 11.00 | 19.00 | 24.00 |
| $10x1\frac{1}{4}x \frac{7}{8}$ | 5 7 8 | 10.00 | 15.00 | 20.00 | 13.00 | 21.00 | 28.00 |
| $12x1\frac{1}{2}x1$ | 5 8 | 12.00 | 17.00 | 23.00 | 15.00 | 23.00 | 31.00 |
| $14 \times 1\frac{1}{2} \times 1\frac{1}{8}$ | 34 | 14.00 | 19.00 | 26.00 | 17.00 | 25.00 | 34.00 |
| $16x1^{3}_{4}x1^{1}_{4}$ | 3/4 7/8 | 16.00 | 22.00 | 30.00 | 19.50 | 29.00 | 40.00 |
| HEAVY | PATTERN W | ITH ST | IFF SWI | EL HO | OKS AN | D SHACE | KLES |
| 8x11/4x 7/8 | 1/2 | 11.00 | 16 00 | 22,50 | 14.00 | 22.00 | 32.00 |
| $10x1\frac{1}{4}x\frac{7}{8}$ | 5.8 | 14.00 | 20.00 | 28.00 | 17.00 | 26,00 | 37.00 |
| 12x112x1 | 5 3 | 16.00 | 23.00 | 31.00 | 19.00 | 29.00 | 41.00 |
| 14x115x116 | 34 | 18.00 | 25.00 | 36.00 | 21.00 | 31.00 | 45.CO |
| $16x1^{3}4x1^{1}4$ | $7\frac{5}{8}$ | 31.00 | 40.00 | 46.00 | 36.00 | 50.00 | 65.00 |
| $18x1\frac{3}{4}x1\frac{1}{4}$ | 7.5 | 34.00 | 45.00 | 60.00 | 40.00 | 56.00 | 75.00 |
| $20x13_4x11_2$ | 1 " | 43.00 | 60.00 | 72.00 | 49.00 | 72.00 | 90.00 |
| | HEAVY PAT | TERN V | VITH LO | OSE SV | VIVEL HO | OOKS | |
| 8x11/4x 74 | 1/2 | 13.00 | 18.00 | 25.50 | 16.00 | 24.00 | 35.00 |
| $10 \times 11/4 \times 7$ | 5 🖔 | 16.00 | 22.00 | 31.00 | 19.00 | 28.00 | 40.00 |
| $12x1\frac{1}{2}x1$ | 5.2 | 19.25 | 26.25 | 35.25 | 22.25 | 32.25 | 45.25 |
| 14x115x114 | 34 | 21.75 | 28.75 | 40.75 | 24.75 | 34.75 | 50.75 |
| 16x13/x11/ | 7. | 35.00 | 44.00 | 49.00 | 40.00 | 54.00 | 70.00 |
| $18x1^{3}/x1^{1}/x$ | 72 | 39,50 | 50.00 | 66.00 | 45.00 | 61.00 | 81.00 |

BLOCKS FOR WIRE ROPE

TACKLE BLOCKS
WITH LOOSE HOOK WITH STIFF HOOK



Fig. 7098A



Fig. 7098B

SNATCH BLOCK SELF-LOCKING CLASP ·



Fig. 7098C

TACKLE BLOCKS FOR WIRE ROPE

With Loose or Stiff Swivel Hooks or Shackles

| DIMENSI | ons, Inches | PRICE | Iron Bushi | ED. EACH | Price. Phosphor-Bronze Bushed, Each | | | |
|---------------------------------|---------------------------------------|-------------------------|-------------------------|-------------------------|--|-------------------------|-------------------------|--|
| Sheaves | Diameter Wire Rope | Single | Double | Triple | Single | Double | Triple | |
| 10x1½x7% 12x1½x1 14x1½x1½ | 1/2 and 5/8 5/8 " 3/4 3/4 " 7/8 | 14.00 16.00 18.00 | 20 00 23.00 25.00 | 28.00 31.00 36.00 | 17.00 19.00 21.00 | 26.00 29.00 31.00 | 37.00 41.00 45.00 | |

These blocks have malleable iron shells and forged steel straps extending below the pins. The shells have rounded edges and middles and will not wear the rope.

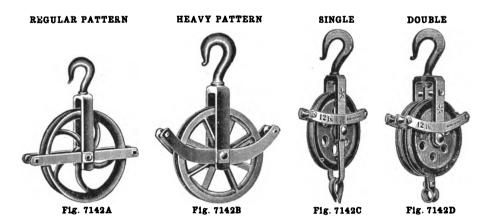
IMPROVED SNATCH BLOCKS FOR WIRE ROPE

| Size of Sheaveinches | 10 | 12 | 14 | $\overline{16}$ | 18 |
|--|--------------|-------------------------|--------------------------|---------------------|------------|
| For Wire Ropeinches Price, Star Metaline Bushed each | 5/8 18.00 | 5 ₈ 21.00 | $\frac{^{3}_{4}}{24.00}$ | $\frac{7}{8}$ 33.00 | 1 44.00 |

Fitted with self-locking clasp, consisting of a lip and link, and having a center extension piece coming close to the sheave, preventing the wire rope from leaving the heave. It also prevents the shell from pinching or binding the sheave.

WROUGHT IRON GIN BLOCKS

WITH SWIVEL HOOKS FOR GRASS AND WIRE ROPE



REGULAR AND HEAVY PATTERNS

| REGULAR PATTERN | | | | | · HEAVY PATTERN | | | | | |
|-------------------|----------------|------------------------|--------------------------|--|-------------------|----------------|------------------------|--------------------------|--|--|
| Sheaves Inches | Rope Inches | Iron Bushed Each | Roller Bushed Each | Self Lubri- cating Metaline or Bronze Bushed Each | Sheaves Inches | Rope Inches | Iron Bushed Each | Roller Bushed Each | Self Lubri- cating Metaline or Bronze Bushed Each | |
| 6 | 1 | 3.15 | 4.00 | 4.75 | 8 | 11/4 | 6.00 | 7.00 | 8.00 | |
| | | | | | 10 | 133 | 8.00 | 9.00 | 10.00 | |
| 8 | 1 | 3.85 | 4.70 | 5.50 | 12 | 112 | 10.00 | 11.00 | 12.00 | |
| | | | | | 15 | 134 | 12.00 | 14.00 | 15.00 | |
| 10 | i | 4.55 | 5.75 | 6.55 | 18 | $1\frac{1}{4}$ | 15.00 | 19.00 | 20.00 | |
| :: | • • | 2.11 | ···: | | | • • • | | | | |
| 12 | 1 | 5.80 | 7.10 | 7.90 | | | | | | |
| 14 | 11/4 | 6.30 | 7.60 | 8.50 | | | | | | |
| 16 | 11/2 | 8.40 | 9.70 | 10.70 | | | 1 | | 1 | |

FOR WIRE ROPE

| | | PRICE, PHOSPHOR-BRONZE, EACH | | | | | |
|-----------------|-------------------|------------------------------|--------|--------|--|--|--|
| Sheaves, Inches | Wire Rope, Inches | Single | Double | Triple | | | |
| 10 | 5 4 | 11.00 | 18.00 | -28.00 | | | |
| 12 | 5 2 | 12.50 | 20.00 | 31.00 | | | |
| 14 | 3 4 | 15.00 | 23.00 | 36.00 | | | |
| 16 | 73 | 18.00 | 27.00 | 46.00 | | | |
| 18 | 1 7 | 23.00 | 32.00 | 53.00 | | | |
| 20 | 116 | 28.00 | 38.00 | 65.00 | | | |

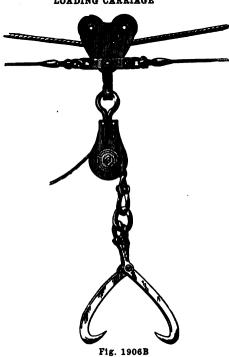
SKIDDER BLOCKS AND LOADING CARRIAGES FOR LOGGING ENGINES

SKIDDER BLOCK



Fig. 1906A

LOADING CARRIAGE



The above Skidder Block is used in connection with Lidgerwood Hoisting Engines for logging. It is made very heavy to withstand severe service. The sheaves can be furnished either of cast or manganese steel, and are renewable when worn. Furnished in 11 and 17-inch diameter sheaves, with rigid or swivel eye, and for any size logging rope.

The Loading Carriage is used for handling logs discharged by skidder and loading same on cars.

Special catalogues describing the above and other Lidgerwood logging equipment will be sent on request.

Prices on application.

YALE AND TOWNE HOISTS

DIFFERENTIAL ORIGINAL WESTON'S PATTERN



DUPLEX SCREW-GEARED



DIFFERENTIAL

| Capacitytons | 1/8 | 1/4 | 1/2 | 1 | 11/2 | 2 | 3 |
|-----------------------|------|-------|-------|-------|----------|------|-------|
| Priceeach | | 18.00 | 21.00 | 28.00 | | | 60.00 |
| " Extra Hoistper foot | 2.80 | 2.80 | 2.80 | 3.00 | 3.20 | 3.40 | 4.00 |
| Regular Hoistfeet | 5 | 6 | 7 | 8 | 8½ 81 | 9 | 914 |
| Weightpounds | 11 | 22 | 30 | 51 | 81 | 122 | 180 |

DUPLEX SCREW-GEARED

| Capacitytons | 1/2 | 1 | 11/2 | 2 | 3 | 4 | 5 | 6 | 8 | 10 |
|-----------------------|------|------|------|------|------|------|------|------|------|--------|
| Priceeach | | | | | | | | | | 275.00 |
| " Extra Hoistper foot | 1.20 | 1.50 | 1.75 | 2.00 | 2.20 | 2.40 | 3.00 | 3.75 | 4.00 | 4.25 |
| Regular Hoistfeet | 8 | 8 | 8 | 9 | 10 | 10 | | 12 | 12 | 12 |
| Weightpounds | 43 | 57 | 76 | 104 | 180 | 215 | 330 | 340 | 380 | 560 |

REPAIRS FOR DUPLEX SCREW-GEARED

| Capacitytons | 1.6 | 1 | 11/2 | 2 | 3 | 4 | 5 | 6 | 8 | 10 |
|----------------------------|--------|------|------------------|------|------|------|-------|-------|-------|-------|
| Price Load Chain Guideeach | | | | | | | | | 1.90 | |
| " Worm and Shaft " | 3.00 | 3.50 | | 4.50 | 5.00 | 7.00 | 10.00 | 12.00 | 18.00 | 22.00 |
| " Top Hook " | 1.00 | 1.40 | 1.80 | 2.40 | 3.00 | 5.00 | 6.00 | 7.00 | 12.00 | 15.00 |
| " Load, Sheaveper pair | 1.50 | 2.00 | 2.50 | 3.00 | 3.50 | 4.50 | 5.00 | 5.50 | 8.00 | 9.00 |
| " Hand Chain per foot | .25 | .25 | .25 | .25 | .25 | .40 | .40 | .40 | .40 | .40 |
| " Load " " | .371/2 | .40 | $.42\frac{1}{2}$ | .45 | .50 | .55 | .60 | .50 | .55 | .60 |

HOISTS TRIPLEX. SPUR GEARED

% TO 2 TON

3 TO 4 TON

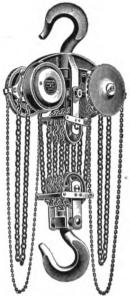
5 TO 10 TON

12 TO 20 TON









Pig. 1434A

Fig. 1434B

Fig. 1434C

Fig. 1434D

| | q | xtra | 4 | REACH | | Снаг | N PULL | |
|-------------------|-------------|----------------------------------|------------------------|--------|--|------------------------------------|--|-------------------|
| Capacity, Tons | Price, Each | Price, Ext Hoist, per Foot | Regular Hoist, Feet | Feet | Minimum Distance Between Hooks, Inches | To Lift Full Load, Pounds | Chain Handled to Lift Load 1 Foot, Feet | Weight, Pounds |
| 1/2 | 35.00 | .90 | 8 | 9-3 | 15 | 62 | 21 | 53 |
| 1 | 45.00 | .95 | 8 | 9-5 | 17 | 82 | 31 | 80 |
| 11/2 | 60.00 | 1.00 | 8 | 9-71/2 | 191/2 | 110 | 35 | 124 |
| 2 | 70.00 | 1.05 | 9 | 11-0 | 24 | 120 | 42 | 188 |
| 3 | 90.00 | 1.50 | 10 | 12-8 | 32 | 114 | 69 | 200 |
| 4 5 6 8 | 110.00 | 1.60 | 10 | 13-1 | 37 | 124 | 84 | 290 |
| 5 | 140.00 | 2.15 | 12 | 15-9 | 45 | 110 | 126 | 380 |
| 6 | 165.00 | 2.15 | 12 | 15-10 | 46 | 130 | 126 | 390 |
| 8 | 200.00 | 2.70 | 12 | 16-3 | 51 | 135 | 168 | 470 |
| 10 | 240.00 | 3.25 | 12 | 16-9 | 57 | 140 | 210 | 570 |
| 12 | 300.00 | 4.30 | 12 | 16-9 | 57 | 130† | 126† | 800 |
| 16 | 360.00 | 5.40 | 12 | 17-1 | 61 | 135† | 168† | 1000 |
| 20 | 425.00 | 6.50 | 12 | 18-5 | 77 | 140† | 210† | 1375 |

A special gearing is made for ¼ and 1 ton sizes. This handles light loads at double speed, but requires double the chain pull. The ¼-ton size in the special gearing is the same in dimensions and price as the regular ½-ton Triplex Block.

[†]For each Hand Chain.

BROWN'S TROLLEYS

STEEL TROLLEYS

Geared

FLAT RAIL TROLLEY



Fig. 5524A

Plain





Fig.

Fig. 5524C

STEEL TROLLEYS

| Capacity Tons | DIAM. INC | Tread Hes | Standard Smallest Radius for Size of I-Beam Curve, Inches | | | WEIGHT | , Pounds | PRICE, EACH | | |
|------------------|-----------|--------------|---|-------|--------|--------|----------|-------------|--------|--|
| Tons | Plain | Geared | Inches | Plain | Geared | Plain | Geared | Plain | Geared | |
| 1/4 | 31/2 | | 4 | 18 | | 25 | | 18.00 | | |
| 1/2 | 4 | l | 5 | 21 | l | 30 | l | 20.00 | | |
| 1 1 | 5 | 5 | 6 | 21 | 21 | 50 | 90 | 25.00 | 55.00 | |
| 11/2 | 6 | 5 | 7 | 34 | 21 | 95 | 140 | 35.00 | 60.00 | |
| 2 | 7 | 7 | 8 | 36 | 36 | 115 | 165 | 40.00 | 65.00 | |
| 3 | 8 | 7 | 9 | 42 | 36 | 140 | 180 | 50.00 | 70.00 | |
| 4 | 9 | 9 | 10 | 48 | 48 | 210 | 320 | 60.00 | 100.00 | |
| 5 | 1016 | 9 | 12 | 54 | 48 | 300 | 350 | 80.00 | 110.00 | |
| 6 | 13 ~ | 13 | 15 | 66 | 60 | 530 | 600 | 120.00 | 160.00 | |
| 8 | 13 | 13 | 20 | 66 | 60 | 550 | 650 | 140.00 | 170.00 | |
| 10 | 13 | 13 | 24 | 66 | 60 | 600 | 670 | 150.00 | 190.00 | |
| 12 | 18 | 18 | 24 | 96 | 96 | 1500 | 1600 | 260.00 | 410.00 | |
| 15 | 18 | 18 | 24 | 96 | 96 | 1550 | 1650 | 300.00 | 420.00 | |
| 20 | 18 | 18 | 24 | 96 | 96 | 2800 | 3000 | 350.00 | 500.00 | |

FLAT RAIL TROLLEYS

| Capacity tons | | | | | | 3 | 4 |
|---|------------------------|------------------------|--------|--------|--------|-------|-------|
| Size of Railinches | $3 \times \frac{1}{2}$ | $3 \times \frac{1}{2}$ | 4 x 34 | 4 x 34 | 4 x 34 | 6 x 1 | 6 x 1 |
| Distance between Hangersfeet Price, Plaineach | 6 | 5 | 6 | 5 | 4 | 6 | 5 |
| Price, Plaineach | 12.00 | 12.00 | 20.00 | 20,00 | 20.00 | 35,00 | 35.00 |
| " Geared " | 30.00 | 30 00 | 35.00 | 35.00 | 35.00 | 50.00 | 50.00 |

Geared Trolleys are fitted with hand chain and sprocket wheel for trolley travel.

CAST IRON TROLLEYS

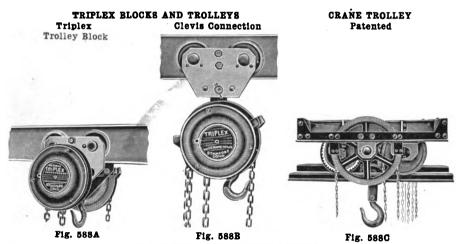


| Capacity | Size of | І Веам | PRICE | Е АСН |
|-------------------------|-----------------------|-------------------------------|----------------------------------|----------------------------------|
| Tons | Inches | Pounds | Plain Bearing | Roller Bearing |
| 1½ 1 1½ 2 3 | 5 6 7 8 9 | 934 1214 15 18 21 | 12.00 16.00 20.00 25.00 | 25.00 27.50 30.00 50.00 |

Fig. 5524D Cast Iron Trolleys can only be used on standard beams of the weights specified.

 $\mathsf{Digitized}\,\mathsf{by}\,Google$

BROWN'S TROLLEYS



TRIPLEX BLOCKS AND TROLLEYS

| | | | | TROL | LEY BLO | оск | | CLEVIS CONNECTION | | | |
|-------|-------|--------------------------------|---|-------|------------------|--------|------------------------------------|---|-------------|--------|--|
| Capa- | Hoist | Size of I Beam Inches | Minimum Distance | | | | Deles | Minimum | PRICE, EACH | | |
| Tons | Feet | | Between Hook and I-Beam Inches | | Weight Pounds | | Price Extra Hoist per Ft. | Distance Between Hook and I Beam Inches | Plain | Geared | |
| 1/2 | 8 | 5 | 81/2 | 123/4 | 105 | 70.00 | .90 | 13 | 65.00 | | |
| 1 | 8 | 6 | 101/2 | 14 | 168 | 85.00 | .95 | 17 | 80.00 | 110.00 | |
| 11/2 | 8 | 7 | 12 | 17 | 210 | 115.00 | 1.00 | 20 | 105.00 | 130.00 | |
| 3 | 9 | 8 | 161/2 | 19 | 280 | 135.00 | 1.05 | 21 | 120.00 | 145.00 | |
| 3 | 10 | 9 | | | | | | 261/2 | 140.00 | 160.00 | |
| 4 | 10 | 10 | | | | | | 38 | 170.00 | 210.00 | |
| 5 | 12 | 12 | | | | | | 41 | 220.00 | 250.00 | |
| 6 | 12 | 15 | | | | | | 41 | 285.00 | 325.00 | |
| 8 | 12 | 20 | | | | | | 48 | 340.00 | 370.00 | |
| 10 | 12 | 24 | | | | | | 48 | 390.00 | 430.00 | |

CRANE TROLLEYS-PATENTED

| Capa- city Tons | DIST BEAT BEAT | TANCE WEEN MS OR UGE" | | E OF | Minumum Distance of Hook Below Top of | Hand Chain Pull Full Load | HAND To TRO | CHAIN MOVE LLEY FOOT | Speed of Travel for One Man With Full Load, Feet | Weight Pounds | Price Each |
|-----------------------|----------------------|--------------------------------|----------------|--------|---|---------------------------------------|-------------------|-------------------------------|--|------------------|---------------|
| | Feet | Inches | Inches | Pounds | Trolley Inches | Pounds | Feet | Inches | per Minute | | |
| 1 | 2 | | 21/4 | 16 | 20 | 9 | 2 | 7 | 85 | 600 | 200.00 |
| 2 | 2 | 4 | 21/4 | 16 | 23 | 15 | 2 | 7 | 80 | 800 | 250.00 |
| 3 | 2 | 4 | $2\frac{1}{4}$ | 16 | 31 | 13 | 3 | 8 | 75 | 1000 | 300.00 |
| 4 | 2 | 4 | 21/4 | 16 | 34 | 17 | 3 | 8 | -70 | 1300 | 340.00 |
| 5 | 2 | 4 | $2\frac{1}{2}$ | 20 | 43 | 19 | 3 | 9 | 65 | 1400 | 370.00 |
| 6 | 2 | 4 | $2\frac{1}{2}$ | 20 | 43 | 22 | 3 | 9 | 60 | 1600 | 410.00 |
| 8 | 2 | 6 | 23/4 | 25 | 44 | 25 | 3 | 9 | 55 | 2000 | 510.00 |
| 10 | 2 | 6 | $2\frac{3}{4}$ | 25 | 46 | 30 | 3 | 9 | 50 | 2200 | 580.00 |
| 15 | 3 | 6 | 3 | 30 | 56 | 45 | 6 | | 22 | 3100 | 780.00 |
| 20 | 3 | 6 | 3 | 30 | 64 | 60 | 6 | | 16 | 3500 | 840.00 |

CURTIS AIR HOISTS

SINGLE ACTING, DOUBLE ACTING AND AIR BALANCED

CLASSES B. H AND J

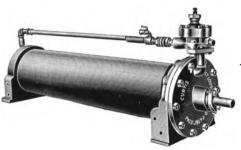


Fig. 5796A

| Inside | Lifting Capa- | Cub. Ft. Free | Net | Inside | Lifting Capacity 80 lbs. Air Pressure Pounds | Cub. Ft. Free | Net |
|----------|---------------|-----------------|------------|----------|--|-----------------|------------|
| Diam. of | city 80 lbs. | Air to lift | Weight | Diam. of | | Air to lift | Weight |
| Cylinder | Air Pressure | Max. Load 1 ft. | 4-ft. Lift | Cylinder | | Max. Load 1 ft. | 4-ft. Lift |
| Inches | Pounds | 80 lbs. Air | Pounds | Inches | | 80 lbs, Air | Pounds |
| 4 5 | 861 | .54 | 80 | 10 | 5636 | 3.29 | 390 |
| | 1356 | .85 | 125 | 12 | 8154 | 5.06 | 500 |
| 6 | 2050 | 1.22 | 150 | 14 | 11270 | 7.13 | 700 |
| 7 | 2791 | | 210 | 17 | 16500 | 10.10 | 900 |
| 8 9 | 3616 4592 | $2.24 \\ 2.85$ | 240 320 | 19 | 20900 | 12.50 | 1100 |

CLASSES A AND G



Fig. 5796B

Class A are Single Acting Pendant Hoists for general hoisting purposes. Class B are same as Class A except that the heads are bracketed so that Hoists may be used in a horizontal position. Valve is detached and end of rod threaded Made to push or pull, as ordered.

Class G are Air Balanced Pendant Hoists having constant air pressure opposing a variable pressure. Are more positive in action and should be specified where close speed control is required.

Class H are same as Class G except that the heads are bracketed like Class B Hoists and can be bolted to frame work or wall either horizontally or vertically. Valve is detached and end of rod threaded.

Class J are bracketed Double Acting Hoists. Air can be admitted to and exhausted from either side of piston. They will both pull and push on piston rod.

All have Automatic Stop and Safety Check.

DOUBLE CYLINDER, DOUBLE FRICTION DRUM

With Boiler and Fixtures, Ratchets and Pawls, Foot Brakes and Two Winch Heads

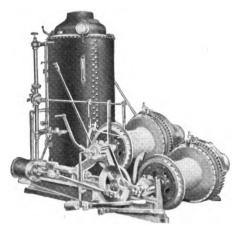


Fig. 1716A

This is the most improved engine for use where two independent drums are required. It is double cylinder type, very quick in starting under heavy load and as the cranks are connected at an angle of ninety degrees there are no dead centers.

The drums contain our latest and most improved form of friction, and are absoutely independent of action and on account of the superior form and extent of the friction surfaces and the cork inserts can be handled with less pressure on the lever than any other form of friction drum. The engines are modern short-stroke type with large steam and exhaust passages and are designed expressly for high speed. Both drums are furnished with shrouded ratchets and pawls of ample strength to hold securely any load the engines can hoist and can be easily thrown in or out of gear. Two improved winch heads are furnished, one on the outer end of each drum shaft. Foot brakes are also furnished.

| Size Number of Engine | $70\frac{1}{16}$ | 701/8 | 701/4 | 703/8 | 71 | 72 | 721/4 | 73 | 74 | 741/4 |
|---------------------------|------------------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
| Rated Horse Power | 6 | 8 | 12 | 16 | 20 | 30 | 35 | 42 | 50 | 60 |
| Diam. of Cylinder inches | - 5 | 5 | 61/4 | 61/4 | 7 | 81/4 | 9 | 10 | 10 | 12 |
| Stroke " " " | 6 | 8 | 8 | 10 | 10 | 10 | 10 | 10 | 12 | 12 |
| Diam. of Hoisting | | | | | Villes | | | | | |
| Drums" | 10 | 12 | 14 | 14 | 14 | 14 | 14 | 15 | 16 | 18 |
| Length of Hoisting | | | | | 1 | | | | 1.77 | |
| Drums " | 20 | 22 | 22 | 26 | 26 | 27 | 33 | 31 | 32 | 34 |
| Weight Heisted Sin- | | | | | | | | | | |
| gle Rope pounds | 1500 | 2000 | 3000 | 4000 | 5000 | 8000 | 9000 | 10500 | 12000 | 16000 |
| Weight Pile Driver | | | | | | | | | 1 | |
| Hammer " | 1000 | 1250 | 1600 | 1800 | 2500 | 3000 | 3500 | 4200 | 5000 | 6500 |
| Diam. of Boiler inches | 30 | 32 | 36 | 38 | 40 | 42 | 48 | 50 | 53 | 56 |
| Height " " | 72 | 75 | 75 | 81 | 84 | 90 | 102 | 102 | 102 | 120 |
| Number of 2-inch Tubes | 44 | 48 | 57 | 68 | 80 | 88 | 115 | 124 | 150 | 165 |
| Width of Bed Plate inches | 40 | 47 | 50 | 54 | 54 | 57 | 63 | 67 | 70 | 74 |
| Length " " " . " | 72 | 80 | 86 | 89 | 89 | 94 | 94 | 110 | 117 | 130 |
| Shipping Weight | 8 | | | | | | | | | |
| Complete pounds | 4900 | 6850 | 8400 | 9725 | 10200 | 12000 | 14200 | 18450 | 21400 | 25950 |

DOUBLE CYLINDER FRICTION DRUM ENGINE AND BOILER



Fig. 1905A

The double cylinder engines are similar to the single cylinder except that they have the special feature of having no centers, the engines being connected at an angle of ninety degrees, thus being much easier to start, handle, etc. This is of special importance particularly for heavy work, as the single cylinder will occasionally get caught on the center. We recommend double cylinder engines where these advantages more than outweigh the difference in the first cost of the engine.

A winch head is fixed to the outer end of drum shaft and is very useful.

| Size Number of Engine | $6\frac{1}{2}$ | 7 | 8 | 81_{2} | _ 9 | 10 | 1014 | 11 | 12 | 12 τ |
|-----------------------------------|----------------|------|------|----------|------|------|-------|-------|-------|-------|
| Rated Horse Power | 6 | 8 | 12 | 16 | 20 | 30 | 35 | 42 | 50 | 60 |
| Diam. of Cylinder inches | 5 | 5 | 614 | 614 | 7 | 814 | 9 | 10 | 10 | 12 |
| Stroke " " " | 6 | 8 | 8 | 10 | 10 | 10 | 10 | 10 | 12 | 12 |
| Weight Hoisted Single Rope pounds | 1500 | 2000 | 3000 | 4000 | 5000 | 8000 | 9000 | 10500 | 12000 | 16000 |
| " Pile Driving Hammer " | 1000 | 1250 | 1600 | 1800 | 2500 | 3000 | 3500 | 4200 | 5000 | 6500 |
| Diameter Body Hoisting Drum | | | | | | | | 1 | | |
| Between Flanges inches | 10 | 12 | 14 | 14 | 14 | 14 | 14 | 15 | 16 | 18 |
| Length Body Hoisting Drum | 1 | 1 | | | 1 | ı | | | | |
| Between Flanges " | 20 | 22 | 22 | 26 | 26 | 27 | 33 | 31 | 32 | 34 |
| Diam. Flanges on Hoisting Drum " | 22 | 24 | 25 | 25 | 25 | 29 | 29 | 33 | 36 | 36 |
| Width of Bed Plate " | 40 | 47 | 50 | 54 | 54 | 57 | 63 | 67 | 70 | 74 |
| Length " " " | 57 | 67 | 71 | 75 | 75 | 79 | 79 | 92 | 97 | 109 |
| Diam, of Boiler Shell " | 30 | 32 | 36 | 38 | 40 | 42 | 48 | .50 | 53 | 56 |
| Height " " " | 72 | 75 | 75 | 81 | 84 | 90 | 102 | 102 | 102 | 120 |
| Number of 2-inch Tubes | 44 | 48 | 57 | 68 | 80 | 88 | 115 | 124 | 150 | 165 |
| Shipping Weight Complete pounds | 4175 | 5350 | 6350 | 7800 | 8250 | 9700 | 11925 | 15160 | 18125 | 21400 |

Prices on application



DOUBLE CYLINDER FRICTION DRUM

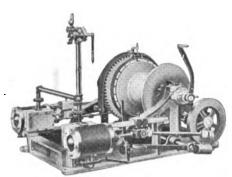


Fig. 1736A

These engines are of a most useful type and are used largely for general hoisting purposes where steam or compressed air is available. They are simple and compact; cannot get caught on the centres and are safer and easier to operate than single cylinder engines.

They are well adapted for use on docks. They can be fixed either at definite points or mounted on dock wheels. In the latter case, being portable, they can be concentrated at any place and unload a vessel very quickly; thus a few engines can be made to cover a large dock, with efficiency and economy. They are also useful on steamers for handling freight and on sailing vessels for handling cargo, sails, anchor, etc.

For small mines, many are in use for depths 50 to 200 feet or more, the drums usually being lagged, increasing the diameter about six inches.

The foot brakes furnished add to safety in handling the load and save wear on the drum friction.

A winch head is fixed to the outer end of the drum shaft and is useful in many ways.

| Size Number of Engine | 32 | 33 | 34 | 35 | 35% | 36 | 3614 | 37 | 38 | 3814 |
|-----------------------------------|------|------|------|------|------|------|------|-------|-------|-------|
| Rated Horse Power | 6 | -8- | 12 | 20 | 30 | 30 | 35 | 42 | 50 | 60 |
| Diameter of Cylindersinches | 5 | 5 | 614 | 7 | 814 | 814 | 9 | 10 | 10 | 12 |
| Stroke " " " | 6 | 8 | 8 | 10 | 10 | 10 | 10 | 10 | 12 | 12 |
| Weight Hoisted, Single Ropepounds | 1000 | 1650 | 2500 | 3500 | 600C | 6000 | 9000 | 10500 | 12000 | 16000 |
| Diameter of Hoisting Drum inches | 10 | 12 | 14 | 14 | 14 | 16 | 16 | 16 | 16 | 18 |
| Length " " " " | 14 | 14 | 16 | 18 | 20 | 26 | 26 | 24 | 24 | 26 |
| Width of Bed Plate " | 34 | 36 | 39 | 44 | 47 | 54 | 54 | 59 | 62 | 65 |
| Length " " " | 44 | 57 | 59 | 70 | 72 | 72 | 73 | 75 | 88 | 89 |
| Shipping Weightpounds | 1800 | 2475 | 2900 | 3575 | 4550 | 5525 | 6000 | 8100 | 9500 | 12450 |

DOUBLE CYLINDER DOUBLE FRICTION DRUM

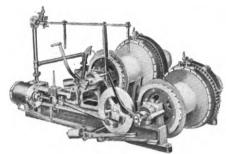


Fig. 1715A

This engine represents our standard double cylinder double drum engine without boiler, which is especially adapted for general derrick work, dock and bridge building, quarries, railroads and pile driving.

It is much lighter and more compact than the double drum engine with boiler, and is adapted for use in places where steam or air is already supplied. In many instances a number of these engines are used by contractors, or in quarries, where the steam is furnished by one main boiler with branch pipes running to the various engines.

Each drum is provided with shrouded ratchets and pawls of ample strength to hold securely any load the engine can hoist.

A winch head, of our regular form, is attached to the outer end of each drum shaft and can be used for hoisting or hauling.

The foot brakes add to the safety and convenience of the engine, and save wear on the drum frictions occasioned by lowering.

Boom swinging gear is also recommended for use with these engines.

| Size Number of Engine | 705/8 | 703/4 | $71\frac{1}{2}$ | 7212 | 7234 | 731/2 | 741/2 | 7434 |
|------------------------------------|-------|-------|-----------------|-----------|------|-------|-------|-------|
| Rated Horse Power | -8 | 12 | 20 | -30^{-} | 35 | 42 | 50 | 60 |
| Diameter of Cylindersinches | 5 | 61. | 7 | 81_4 | 9 | 10 | 10 | 12 |
| Stroke of Cylinders " | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 |
| Diam. of Hoisting Drum " | 12 | 14 | 14 | 14 | 14 | 15 | 16 | 18 |
| Length " " " | 14 | 10 | 18 | 20 | 22 | 25 | 24 | 26 |
| Weight Hoisted, Single Rope pounds | 2000 | 2500 | 50C 0 | 8000 | 9000 | 10500 | 12000 | 16000 |
| " of Pile Driving Hammer " | 1250 | 1600 | 2500 | 3000 | 3500 | 4200 | 5000 | 6500 |
| Width of Bed Plateinches | 38 | 39 | 44 | 47 | 51 | 59 | 62 | 641/2 |
| Length " " " | 76 | 76 | 88 | 88 | 88 | 93 | 107 | 110 |
| Shipping Weight pounds | 3925 | 4650 | 5700 | 6800 | 8050 | 11250 | 13100 | 16800 |

LIDGERWOOD BELT HOISTS

SINGLE FRICTION DRUM

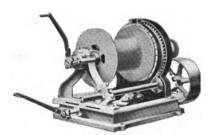


Fig. 1714A

This is an improved friction drum belt hoist with cork insert friction and brake and pulley complete. Suitable for factories, warehouses, docks, ice houses, quarries, mines, etc. This machine is compact, substantial and serviceable, and is mounted on a strong bed plate. The drum is loose on the shaft and engages with the friction by being forced along the shaft by means of the lever shown in the illustration. The drum is furnished with a band foot brake of our regular differential type which is very powerful and easily applied.

This hoist may be operated either by belting from a line shaft, or stationary engine, or from a gas or gasoline engine. It is sometimes desirable to connect it directly to a gasoline engine, and in such cases, a gear wheel can be substituted for the pulley wheel shown.

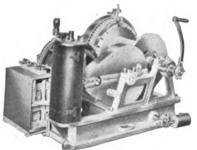
A winch head is attached to the outer end of the drum shaft.

The friction and brake levers may be arranged to be connected together by a rod, if desired, so they may be moved simultaneously.

| Size, Number of Hoists 191 192 193 191½ 192½ Diameter of Hoisting Drum inches 10 14 16 16 16 Length " " " " " 19 22 26 28 28 Diameter of Pulley " 20 22 30 30 36 Face " " " " 6½ 8½ 8½ 12½ 12½ Pinion, Number of Teeth 16 13 15 15 16 Spur, " " " " 67 59 75 75 79 Weight Hoisted, Single Rope, pounds 1000-1500 2000-3000 4000 6000 8000 8000 8000 8000 Speed of Hoist per Minute feet 100-150 150-200 175-250 175-250 175-250 200-275 39 45 54 57 62 Length of " " " 29 36 57 57 54 | | | | | | |
|---|-------------------------------------|-----------|-----------|---------|---------|---------|
| Length " " 19 22 26 28 28 Diameter of Pulley " 20 22 30 30 36 Face " " 6½ 8½ 8½ 12½ 12½ 12½ Pinion, Number of Teeth 16 13 15 15 16 Spur, " " 67 59 75 75 79 Weight Hoisted, Single Rope, pounds 1000-1500 2000-3000 4000 6000 8000 Speed of Hoist per Minute feet 100-150 150-200 175-250 175-250 200-275 Width of Bed Plate inches 39 45 54 57 62 | Size, Number of Hoists | 191 | 192 | 193 | 1911/4 | 1921/4 |
| Length " " 19 22 26 28 28 Diameter of Pulley " 20 22 30 30 36 Face " " 6½ 8½ 8½ 12½ 12½ 12½ Pinion, Number of Teeth 16 13 15 15 16 Spur, " " 67 59 75 75 79 Weight Hoisted, Single Rope, pounds 1000-1500 2000-3000 4000 6000 8000 Speed of Hoist per Minute feet 100-150 150-200 175-250 175-250 200-275 Width of Bed Plate inches 39 45 54 57 62 | Diameter of Hoisting Druminches | 10 | 14 | 16 | 16 | 16 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | | 22 | 26 | 28 | 28 |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | Diameter of Pulley " | 20 | 22 | 30 | 30 | 36 |
| Pinion, Number of Teeth 16 13 15 15 75 75 Spur, " " 67 75 75 75 Weight Hoisted, Single Rope, pounds 1000-1500 2000-3000 4000 6000 8000 Speed of Hoist per Minute 16 150-200 175-250 175-250 175-250 200-275 Width of Bed Plate 10 39 45 54 57 62 | | 61/2 | 81/2 | 81/2 | 121/2 | 121/2 |
| Weight Hoisted, Single Rope, pounds 1000-1500 2000-3000 4000 6000 6000 175-250 175-250 175-250 200-275 Speed of Hoist per Minute feet width of Bed Plate inches 39 45 54 57 62 | Pinion, Number of Teeth | 16 | 13 | 15 | 15 | |
| Speed of Hoist per Minute 100-150 150-200 175-250 175-250 200-275 Width of Bed Plate inches 39 45 54 57 62 | Spur, " " " | 67 | 59 | 75 | 75 | 79 |
| Width of Bed Plateinches 39 45 54 57 62 | Weight Hoisted, Single Rope, pounds | 1000-1500 | 2000-3000 | 4000 | 6000 | 8000 |
| Width of Bed Plateinches 39 45 54 57 62 | Speed of Hoist per Minute feet | 100-150 | 150-200 | 175-250 | 175-250 | 200-275 |
| Length of " " " 29 36 57 57 54 | Width of Bed Plateinches | 39 | 45 | 54 | 57 | 62 |
| | Length of " "" | 29 | 36 | 57 | 57 | 54 |
| Shipping Weight pounds 1400 2400 4200 4375 5975 | Shipping Weight pounds | 1400 | 2400 | 4200 | 4375 | 5975 |

LIDGERWOOD INDUCTION MOTOR HOISTS

Alternating Current, Two-Phase or Three-Phase, 60 Cycles, 110, 220 440, 550 Volts SINGLE DRUM



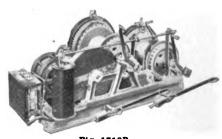


Fig. 1713A

Pig. 1713B

SINGLE DRUM

These hoists are admirably adapted to the use of contractors, railroads, etc., and for docks, warehouses and other purposes where a light, portable hoist is required. The motors are designed for moderate speed and are not enclosed. They are wound for two-phase or three-phase current at 60 cycles, and 110, 220, 440, and 550 volts. The ratings are for hoisting purposes. Motors wound to use current of different characteristics will be furnished if desired, but at extra cost. The controllers are of the

drum type.

The resistances are on the rear of the bed-plate where they are easily accessible. Solenoid brakes can be furnished if desired. Also furnished mounted on wheels if so ordered

| Size Number of Hoist | 420 | 421 | 422 | 423 | 424 | 425 |
|----------------------------------|------------|------------|------------|------------|------------|------------|
| Motor Horse Power | 112 | 2 | 3 | 5 | 71/2 | 11 |
| Style of Motor | M.T.C.5122 | M.T.C.5140 | M.T.C.5160 | M.T.C.5180 | M.T.C.5201 | I.T.C.5008 |
| Diameter of Hoisting Drum inches | 8 | 8 | 8 | 12 | 12 | 12 |
| Length " " " | 9 | 12 | 12 | 15 | 15 | 15 |
| Weight Hoistedpounds | 300 | 500 | 500 | 1000 | 1000 | 1000 |
| Speedfeet per minute | 100 | 100 | 150 | 100 | 150 | 250 |
| Width of Bed Plateinches | 25 | 2 8 | 27 | 34 | 34 | 34 |
| Length " " " | 32 | 321/2 | 34 | 4516 | 431/2 | 451/2 |
| Shipping Weightpounds | 1200 | 1325 | 1400 | 2150 | 2200 | 2450 |

DOUBLE DRUM

Both Drums Revolving in the Same Direction

Designed especially for contractors and general derrick work and for use on rail-

roads, docks, or in quarries.

The special feature of this style is the pinion interposed between the drums causing both drums to revolve in the same direction. This is a desirable feature when it is intended to add swinging gear at some future time as it takes the lead of the rope to the forward drum entirely clear of the swinging gear. Furnished with solenoid brake, if desired. Mounted on dock wheels if so ordered.

| | | | | | |
|----------------------------------|---------------------|-------------|------------|------------|------------|
| Size Number of Hoist | 526P | 527P | 528P | 529P | 530P |
| Motor Horse Power | 15 | 18 | 22 | 37 — | 52 |
| Style of Motor | 1. T .C.5009 | 1.T.C.55010 | 1.T.C.5011 | 1.T.C.5012 | 1.T.C.5013 |
| Diameter of Hoisting Drumsinches | | 12 | 14 | 16 | 16 |
| Length " " " | 16 | 20 | 27 | 24 | 30 |
| Weight Hoisted pounds | 2000 | 2500 | 3000 | 4500 | 6000 |
| Speed feet per minute | 175 | 175 | 175 | 200 | 200 |
| Width of Bed Plate inches | 41 | 47 | 55 | 55 | 60 |
| Length" " " " | 79 | 79 | 80 | 93 | 101 |
| Shipping Weightpounds | 4975 | 6200 | 7025 | 9225 | 10850 |
| | | | | | |

Prices for single drum and double drum on application.

WINCHES

WOOD FRAME, SINGLE DRUM

SINGLE PURCHASE



DOUBLE PURCHASE

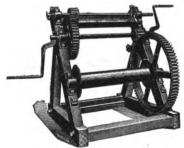


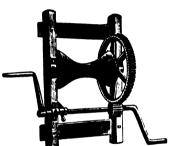
Fig. 5741B

SINGLE PURCHASE-Capacity for Four Men

| Number | 6298 | 6299 | 6300 | 6301 | 6302 |
|---|-------|-------|---------------|-------|-------|
| Size of Druminches | | | | | |
| Diameter of Gear and Pinion " | 28, 4 | 28, 4 | 28, 4 | 28, 4 | 28, 4 |
| Pull of Two Men on Single Linepounds | 2000 | 2000 | 2000 | 1500 | 1500 |
| Lift with Two and Three Sheave Blocks 2 Men " | 10000 | 10000 | 10000 | 7500 | 7500 |
| Priceeach | 35.00 | 37.00 | 3 8.00 | 35.00 | 37.00 |

DOUBLE PURCHASE-Capacity for Four Men

| Number | 6305 | 6306 | 6307 | 6308 | 6309 |
|---|--------|--------|--------|--------|--------|
| Size of Druminches | | | | | |
| Diameter of Gears " | 28, 18 | 28, 18 | 28, 18 | 28, 18 | 28, 18 |
| " "Pinion " | 4 | 4 | 4 | 4 | 4 |
| Pull of Two Men on Single Linepounds | 7500 | 7500 | 7500 | 5000 | 5000 |
| Lift with Two and Three Sheave Blocks " | 37500 | 37500 | 37500 | 25000 | 25000 |
| Price each | 60.00 | 65.00 | 70.00 | 60.00 | 65.00 |
| " with Brake " | 70.00 | 75.00 | 80.00 | 70.00 | 75.00 |



HOISTING WINCH-Concave Drum IRON DRUM WOOD FRAME

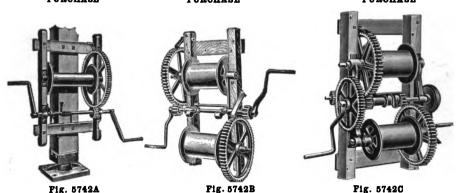
| Size of Wheeli | nches | 24x21/2 | 30x21/2 |
|----------------|-------|---------|---------|
| Price | .each | 50.00 | 55.00 |

Fig. 57410

DERRICK WINCHES

WOOD FRAME

SINGLE DRUM, SINGLE PURCHASE DOUBLE DRUM, SINGLE PURCHASE DOUBLE DRUM, DOUBLE PURCHASE



SINGLE DRUM, SINGLE PURCHASE

| Number | F | A | В | C | D | E |
|-----------------------------------|--------|--------|--------|--------|-------|-------|
| Size of Druminches | 5x17 | 6x21 | 6x26 | 6x30 | 9x16 | 9x21 |
| For Ropekind | Manila | Manila | Manila | Manila | Wire | Wire |
| Load for Two Men, Single Linelbs. | 1700 | 1700 | 1700 | 1700 | 1200 | 1200 |
| " " " Block." | 3400 | 3400 | 3400 | 3400 | 2400 | 2400 |
| Priceeach | 34.00 | 36.00 | 37.50 | 38.50 | 35.00 | 37.50 |

DOUBLE DRUM, SINGLE PURCHASE

| Number | | В | _ c _ | D | E | F |
|-----------------------------------|--------|--------|--------|-------|-------|--------|
| Size of Druminches | 6x21 | 6x26 | 6x30 | 9x16 | 9x21 | 5x17 |
| For Ropekind | Manila | Manila | Manila | Wire | Wire | Manila |
| Load for Two Men, Single Linelbs. | | | 1700 | 1200 | 1200 | 1000 |
| " " " " Block." | 3400 | 3400 | 3400 | 2400 | 2400 | 2000 |
| Priceeach | 50.00 | 55.00 | 60.00 | 55.00 | 60.00 | 47.00 |

SINGLE DRUM, DOUBLE PURCHASE WITH BRAKE

| Number | A | В | C | D |
|--|--------|--------|-------|-------|
| Size of Druminches | | | 9x16 | 9x21 |
| For Ropekind | Manila | Manila | Wire | Wire |
| Load for Two Men, Single Block, Fast Speedpounds | 3400 | 3400 | 2400 | 2400 |
| " " " Slow " " | 12000 | 12000 | 9000 | 9000 |
| Priceeach | 68.00 | 72.00 | 68.00 | 72.00 |

DOUBLE DRUM, DOUBLE PURCHASE WITH BRAKE

| Number | A | В. | C | D |
|--|--------|--------|--------|--------|
| Size of Druminches | | | | 9x21 |
| For Ropekind | Manila | Manila | Wire | Wire |
| Load for Two Men, Single Block, Fast Speedpounds | 3400 | 3400 | 2400 | 2400 |
| " " " Slow " " | 12000 | 12000 | 9000 | 9000 |
| Priceeach | 100.00 | 110.00 | 100.00 | 110.00 |



WINCHES

IRON WINCHES WITH BRAKE

SINGLE PURCHASE







Pig. 5744A

SINGLE PURCHASE-Capacity for Four Men

| Number | 6250 | 6251 | 6252 | 6253 | 6254 |
|--|-------|-------------------|-------|--------------|-------|
| Size of Druminches Diameter of Gear and Pinion" | 4½x12 | 4½x14 | 4½x16 | 5x18 | 6x21 |
| Diameter of Gear and Pinion | 18,6 | $21,5\frac{1}{4}$ | 24,4 | 25, 4 | 25, 4 |
| Size of Nigger Heads " | | | 4x6 | | |
| Pull of Two Men on Single Linepounds | 900 | 1250 | 1800 | 2 500 | 2000 |
| Lift with two and three Sheave Blocks, two men " | 4500 | 6250 | 9000 | 12500 | 10000 |
| Priceeach | 29.00 | 31.00 | 36.00 | 45.00 | 45.00 |
| Extra for Nigger Heads on Drum Shaft " | 7.00 | 7.50 | 8.00 | 8.50 | 8.50 |

DOUBLE PURCHASE-Capacity for Four Men

| Number | 6258 | 6259 | 6260 | 6261 | 6262 | 6263 | 6264 |
|---|------------------|-------------|----------------|----------------|----------------|----------------|----------------|
| Size of Druminches Diam, of Gear | 4½x16 24 | 4½x18 25 | 5x19 27 | 6x21 29 | 6½x22 33 | 9x16 25 | 9x21 25 |
| " " Pinions " | 9, 4 | 9, 4 | 131/2, 4 | 121/2, 5 | 131/2, 51/2 | 81/4, 4 | 81/4,4 |
| Size of Nigger Heads " | 4x6 | 6x7 | 6x7 | 6x7 | 6x7 | 4x6 | 4x6 |
| Pull of Two Men on Single Line lbs. | 3000 | 4000 | 4500 | 4500 | 5000 | 3000 | 3000 |
| Lift, two and three Sheave Blocks, two men. " Priceeach | $15000 \\ 42.00$ | 1 | 22500 61.00 | 22500 67.00 | 25000 75.00 | 15000 60.00 | 15000 65.00 |
| Extra for Nigger Heads on Drum Shaft " | 8.50 | 9.00 | 9.50 | 9.50 | 10.00 | 8.50 | 8.50 |

Add 5.00 to list for Winch with Wheel Brake.

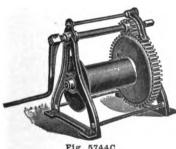


Fig. 5744C

ONE MAN WINCH

No. 14

| Size of Druminches | 5x12 |
|---|--------------|
| Diameter of Gearinches | 14 21/6 |
| Diameter of Gear inches " Pinion " Capacity pounds Price each | 500 15.00 |

WINCHES AND WINDLASSES

WAGON WINCHES

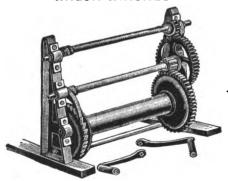


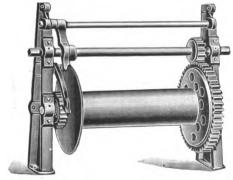
Fig. 5743A

| Number | 1 | 2 | 3 | 4 | 5 |
|--|--------|--------|--------|-------|-------|
| Capacity tons | 20 | 16 | 12 | 8 | 4 |
| Weight without Oak Frame and Hookspounds | 425 | 350 | 300 | 225 | 200 |
| Price " " " " each | 125.00 | 110.00 | 90.00 | 75.00 | 60.00 |
| " with " " " " | 137.50 | 122.50 | 101.00 | 86.00 | 71.00 |

IRON TRUCK WINDLASSES

SINGLE GEAR







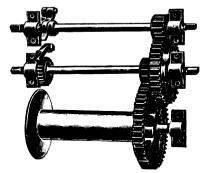


Fig. 5743C

| Number | 1 | • •2 | 3 | 2A | 3A | 4.4 |
|---|--------------------------|-----------------------------------|--------|--------|--------|----------|
| Size of Druminches | 20 x 4 | $\frac{20 \times 4}{20 \times 4}$ | 20 x 6 | | 20 x 4 | 20 x 6 |
| Gear " | Single | Double | Double | Double | Double | Double |
| | $15 \times 1\frac{1}{2}$ | _ / 4 | 18 x 2 | | | 18 x 2 |
| Center to Center of Frames " Capacitytons | 27 3 | 29 | 32 | 27 | 29 | 32 25 |
| Priceeach | 2 5.00 | 35,00 | 40.00 | 35,00 | 40.00 | 65.00 |

Double Geared Windlasses are furnished without frames. Always state distance from center to center desired on uprights.

DERRICKS

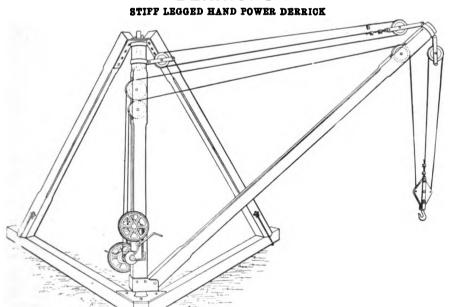


Fig. 2798A .
STIFF LEGGED FOR DOUBLE DRUM, STEAM OR HORSE POWER

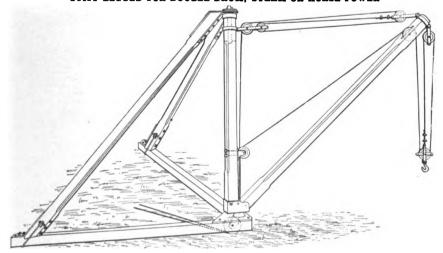


Fig. 2798B

Above style derricks furnished any size and capacity. Prices on application.

DERRICKS

HAND POWER GUY DERRICK

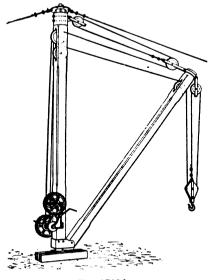


Fig. 2799A

GUY DERRICK. OPERATED BY DOUBLE DRUM, STEAM OR HORSE POWER

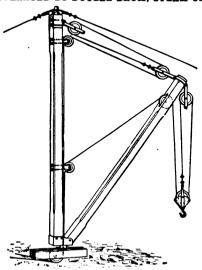
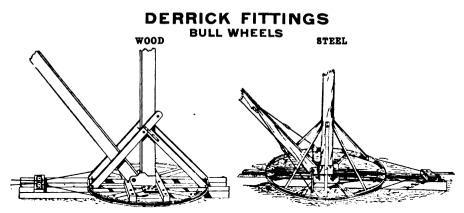


Fig. 2799B

Prices on application.



| Pig. | 2800A |
|------|-------|
|------|-------|

WOOD

Pig. 2800B

| Number | 313 | 314 | 315 | 316 |
|-----------------------------------|-------|-------|-------|--------|
| Diameter of Wheel | 8 | 10 | 12 | 14 |
| Diameter of Wheel feet Price each | 70.00 | 80.00 | 90.00 | 100.00 |

STEEL

| Number | 306 | 307 | 308 | 309 | 310 | 311 |
|-----------------------------------|-------|--------|--------|--------|--------|--------|
| Diameter of Wheel feet Price each | 5 | 8 | 10 | 12 | 14 | 16 |
| Price each | 90.00 | 100.00 | 110.00 | 130.00 | 160.00 | 200.00 |

Prices of wood or steel do not include foot blocks, guide sheaves and timber.

STANDARD

DERRICK CASTINGS FOOT BLOCKS

AMERICAN





Fig. 2800C

STANDARD FOOT BLOCKS

Fig. 2800D

| Number | 410 | 411 | 412 | †4121/2 | 413 | *414 | 415 | 416 |
|----------------------------|-------|-------|-------|---------|-------|-------|-------|-------|
| Sizenumber | A | A | В | В | C | D | D | E |
| Inside Measure Mast inches | 8 | 10 | 12 | 12 | 14 | 16 | 16 | 18 |
| " Boom " | 8 | 8 | 10 | | | 14 | | 16 |
| Priceeach | 11.50 | 11.50 | 14.50 | 16.50 | 21.00 | 26.50 | 42.00 | 45.00 |

| AMERICAN FOOT BLOCK |
|---------------------|
|---------------------|

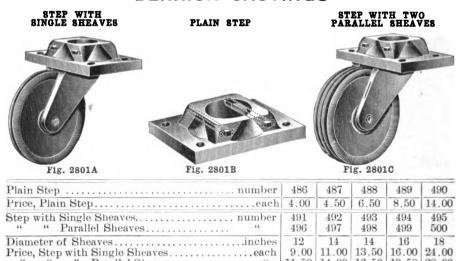
| Number | 4161/2 | 417 | 418 | †418½ | 419 | †420 | 421 | 422 |
|----------------------------|--------|-------|-------|-------|-------|-------|-------|-------|
| Sizenumber | A | A | В | В | C | C | D | Е |
| Inside Measure Mast inches | 8 | 10 | 12 | 12 | 14 | 14 | 16 | 18 |
| " Boom " | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 16 |
| Priceeach | 12.00 | 12.00 | 15.00 | 20.00 | 22.00 | 34.00 | 43.00 | 50.00 |

†Heavy. *Light.

Foot block without groove for safety keys shipped unless specified with groove.

11.50 14.00 16.50 19.50 28.00

DERRICK CASTINGS



All sheaves in the standard fittings have phosphor bronze bushings unless otherwise ordered. Steps furnished without keys unless otherwise ordered.

" Parallel Sheaves..... "

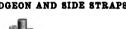


| 116. 20012 | 116. 20022 | | | 116. 20011 | | | |
|--|--------------|------|--|------------|------------|---|----------------------------|
| Plain Cap for Top of Mast Mast Top Square | | | 559 515 | 560 516 | 561 517 | 562 518 | 562½ 519 |
| Inside Measure, Plain Cap " " Mast Top Square Price, Plain Cap for Top of Mast " Mast Top Square | " each | 1.80 | $ \begin{array}{r} 8^{1}_{2} \\ 8 \\ 2.00 \\ 12.00 \end{array} $ | | | 13 ¹ / ₂ 14 4.50 27.00 | 15½ 16 7.50 36.00 |
| Mast and Gaff Fitting | - | | n | umber | 780 | 781 | 782 |
| Diameter of Mast Price Mast and Gaff Fitting | | | | | | | 9 28.00 |

DERRICK CASTINGS

MAST TOP WITH OFFSET GUDGEON AND SIDE STRAPS

Pig. 2802A





PLAIN



FALL LINE BALLS



WITH HOOK

Fig. 2802C

MAST TOP WITH OFFSET GUDGEON AND SIDE STRAPS

Fig. 2802B

| Number | 506 | 507 | 508 | 509 | 510 |
|------------------------------------|-----|-------------|-------------|-------------|-------------|
| Inside Measurementinches Priceeach | 8 | 10 20.50 | 12 27.50 | 14 35.00 | 16 46.00 |

FALL LINE BALLS-Plain

| Number | | | | | | | | | | | | |
|--------------------------|------|------|------|-------|-------|-------|--|--|--|--|--|--|
| Weight pounds | 50 | 68 | 105 | 218 | 300 | 500 | | | | | | |
| Weight pounds Price each | 4.50 | 5.00 | 7.50 | 14.00 | 20.00 | 35.00 | | | | | | |

FALL LINE BALLS-With Hook

| Number | 4887 | 4888 | 4889 | 4890 | 4891 | 4892 | 4893 | 4894 | 4895 | 4896 | 4897 | 4898 |
|-------------------------------------|-----------------|----------------|-------------------|-------------------|-------------------|-----------------|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Capacitytons Weightpounds Priceeach | 3 73 7.00 | 5 86 800 | 3 120 10.00 | 5 125 11.00 | 5 235 16 00 | $\frac{8}{242}$ | 8 325 21.00 | 12 335 23.00 | 20 360 26.00 | 12 535 33.00 | 20 560 36.00 | 30 637 55.00 |

BRACKET WITH TWO SHEAVES

FLAT SPLIT BOOM BAND WITH WELDED EXTENSION TO SHEAVE PIN



Fig. 2802D



Fig. 2802E

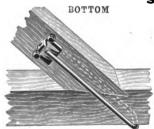
BRACKETS WITH SHEAVES FOR FACE OF MAST

| Number | 4781 | 4783 | 4785 | 4787 | 4789 | 4792 | 4794 | 4796 | 4798 | 4800 |
|-----------------------------------|------|------|-------|-------|-------|------|------|------|------|-------|
| Dia. of Sheave, in. | 8 | 10 | 12 | 14 | 16 | 8 | 10 | 12 | 14 | 16 |
| Price, 2 Sheaves, ea. "1 Sheave," | 8.20 | 8.80 | 10.60 | 11.50 | 13.50 | 6.30 | 6 60 | 7.60 | 8 50 | 10 00 |

FLAT SPLIT BOOM BANDS

| Number | 683 | 684 | 685 | 686 | 687 |
|------------------------|-------|-------|-------|-------|-------|
| Diameter Inside inches | | 9 | 10 | 12 | 14 |
| Priceeach | 13.00 | 14.50 | 17.00 | 20.00 | 23.25 |

DERRICK FORGINGS STIFF LEG STRAPS



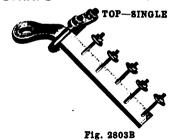


Fig. 2803A

BOTTOM

| Number | 612 | 613 | 614 | 615 | 616 | 605 | 606 | 607 | 608 | 609 |
|--|------|------|------------|----------|---------------------------|-------|-------|----------|--------|--------|
| Size of Ironin. Width of Sill" Priceeach | 1 6 | 11/8 | 11/4 10 | 1½ 12 | $\frac{1\frac{3}{4}}{12}$ | 5 x ½ | 6 x 1 | 6 x 11/4 | 6 x 1½ | 8 x 1½ |
| Priceeach | 2.50 | 4.00 | 6.00 | 10.00 | 14.00 | 8.00 | 9.50 | 11.00 | 14.00 | 18.00 |

FLAT SPLIT BANDS
With One Link With Two Links



GUY CAPS

Steel











FLAT SPLIT BANDS WITH ONE LINK

WITH TWO LINKS

| Number | 648 | 649 | 650 | 651 | 652 | 673 | 674 | 675 | 676 | 677 |
|---|-----|-----|-----------------|-----------------|------------------|-----------------|----------------|------------------|------------------|------------------|
| Sizenumber Diam. Inside in. Priceeach | 8 | 9 | B 10 7.00 | C 12 8.50 | D 14 10.00 | AA 8 7.80 | A 9 8.25 | B 10 10.00 | C 12 11.75 | D 14 14.00 |

GUY CAPS

| Number with Links without Links | | 534 542 | 535 543 | 536 544 | 537 545 | 538 546 | 539 547 | 540 548 |
|-------------------------------------|--------|--------------|--------------|------------|---------------|------------|------------|------------|
| Sizenumber Number of Guys | A 4 | B | A 5 | B 5 | C 5 | D 6 | E 6 | E 8 |
| Diam. of Mast at Topinches | 8 | 10 | 8 | 10 | 12 | 14 | 16 | 16 |
| Price, with Linkseach without Links | | 7.80 6.00 | 6.50 4.50 | | 10.00 7.00 | | | |

STEEL GUY CAPS

| Number | 549 | 550 | 551 | 552 | 553 | 554 | 555 | 556 | 557 |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Sizenumber | | В | A | В | C | D | E | E | E |
| Number of Guys | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 8 | 10 |
| Diam. of Mast at Top. in. | 8 | 10 | 8 | 10 | 12 | 14 | 16 | 16 | 16 |
| Price, with Linkseach | 16.00 | 16.50 | 17,50 | 18.00 | 21.00 | 23.50 | 26.50 | 30.00 | 34.00 |
| " without Links " | 11.00 | 11.50 | 11,50 | 12.00 | 13.00 | 14.50 | 16.50 | 17.00 | 18.00 |

TURN-OVER AND BOTTOM DUMP BUCKETS

TURN-OVER BUCKETS



Fig. 6125A



Pig. 6125B

Turn-Over Buckets are made from steel plates, fitted with wooden bottom, are used for handling coal, sand, gravel and other materials.

The catch which holds the bucket in a vertical position is of a special design and is so adjusted that there is little or no chance for the bucket to dump accidentally should it come in contact with an obstruction while being hoisted from the hold of the vessel.

The illustration shows a round bucket, but a square bucket can be furnished if so ordered. They are built in the following sizes: $\frac{1}{2}$, $\frac{3}{4}$, 1, $\frac{1}{2}$, 2, $\frac{21}{4}$, $\frac{21}{2}$, 3, $\frac{3}{2}$, and 4 cubic yards capacity.

Prices and further information furnished upon application.

BOTTOM DUMP BUCKETS



Fig. 6125C



CLOSED

Fig. 6125D

Bottom Dump Buckets are used extensively for handling concrete, broken stone, coal and rough materials. They are built either round or square and are fitted with rigid or swinging bails and built in the following sizes: $\frac{1}{2}$, $\frac{3}{4}$, $\frac{1}{1}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{2}{1}$, $\frac{3}{2}$, and 4 cubic yards.

Weights, prices, etc., will be furnished upon application.

ORANGE PEEL BUCKETS

OPEN





Fig. 6127A



CLOSED

Fig. 6127B

STANDARD ORANGE PEEL BUCKETS

| | CLO | SED | Ор | EN | Approx- | |
|-------------------------|--------------------------------|------------------------------|--------------------------------|-------------------------------|---------------------------|---------------|
| Capacity . | Diameter Feet and Inches | Height Feet and Inches | Diameter Feet and Inches | Height Feet and, Inches | imate Weight Pounds | Price Each |
| 2½Cu. Ft. | 2-6 | 3-9 | $3-\overline{2}$ | 4 3 | 550 | 300.00 |
| 5 " | 3-2 | 4—9 | 4-0 | 5-4 | 1000 | 450.00 |
| 7 " | 3 6 | 5—0 | 4 3 | 5— 8 | 1100 | 475.00 |
| 9 " | 3—10 | 5-2 | 4 8 | 510 | 1200 | 500.00 |
| 12 " | 4-3 | 64 | 5 0 | 7 — 0 | 2200 | 725.00 |
| 15 " | 4 6 | 66 | 5— 6 | 7— 3 | 2350 | 775.00 |
| 21 " | 5 0 | 7—9 | 6 4 | 8-6 | 3300 | 1000.00 |
| 1 Cu. Yd. | 5— 8 | 80 | 6—10 | 9— O | 4200 | 1100.00 |
| □ ₄ Cu. Yds. | 6 0 | 8-3 | 7 3 | 9 6 | 4600 | 1200.00 |
| 11/2 " | 6-4 | 96 | 8— 0 | 10 9 | 7750 | 1600.00 |
| 2´ " " | 7 0 | 10—0 | 8— 6 | 11 3 | 8500 | 1750.00 |
| 21/2 " | 7-8 | 10-4 | 9-4 | 11 9 | 9500 | 1950.00 |
| 3´* " | 8— 0 | 10-8 | 9-10 | 12 - 3 | 10500 | 2150.00 |

EXTRA HEAVY STANDARD ORANGE PEEL BUCKETS

| 21 Cu. Ft. | 5 0 | 7—9 | 6-4 | 86 | 4200 | 1100.00 |
|------------------|-------|------|-------|--------|-------|---------|
| 1 Cu. Yd. | 5— 8 | 8-0 | 6-10 | 90 | 4600 | 1200,00 |
| 11/4Cu. Yds. | 6 0 | 8-3 | 7— 3 | 9-6 | 5000 | 1300.00 |
| 11/2 " | 6-4 | 96 | 8 0 | 10-9 | 8500 | 1750.00 |
| 2 " | 7 0 | 10-0 | 8 6 | 11-3 | 9500 | 1950.00 |
| $2\frac{1}{2}$ " | 7 8 | 10-4 | 9 4 | 11-9 | 10500 | 2150.00 |
| 3 " | 8 0 | 10-8 | 9—10 | 12 - 3 | 11500 | 2250.00 |
| 4 " | 8—10 | 12-6 | 10—6 | 14 - 3 | 18000 | 3450.00 |
| 5 " | 9 6 | 13-0 | 11 4 | 14-9 | 20000 | 3850.00 |
| 6 " | 10— 0 | 14-3 | 12— 8 | 16-0 | 22000 | 4250.00 |
| 8 " | 11-4 | 15-0 | 13-8 | 17-0 | 26000 | 5000.00 |
| 10 " | 12- 0 | 16-0 | 14 6 | 180 | 32000 | 6200.00 |

CLAM SHELL AND SCOOP BUCKETS





Fig 6126A



CLOSED

Fig. 6126B

| Capacity | | OPEN | | Approximate | |
|----------------|------------------------------|-------------------------------|-------------------------------|------------------|---------------|
| Cubic Yards | Width, Feet and Inches | Height, Feet and Inches | Length, Feet and Inches | Weight Pounds | Price Each |
| 1/2 | 3.3 | 5-10 | 5-7 | 2100 | 600.00 |
| 3/4 | 3-3 | 6-10 | 6-10 | 2350 | 700.00 |
| 1 | 3-3 | 7-8 | 7-6 | 2600 | 800.00 |
| 11/2 | 3-9 | 8.6 | 8-6 | 3800 | 950.00 |
| 15/8 | 4-0 | 8-6 | 8-6 | 4000 | 1000.00 |
| 2 | 5-0 | 8-6 | 8-6 | 4750 | 1200.00 |
| | 5-0 | 9-9 | 9-9 | 5800 | 1450.00 |
| $\frac{21}{2}$ | 6-0 | 9-9 | 9-9 | 6500 | 1700.00 |
| 4 | 6-0 | 10-9 | 11-0 | 9000 | 2250.00 |
| 5 | 7-0 | 11 3 | 11-0 | 11000 | 2800.00 |

SCOOP BUCKETS



Fig. 6126C



Fig. 6126D

Scoop Buckets are designed for handling coal, ore, sand and other materials. They are built of steel plates and fitted with a tail latch which acts as an automatic tripping device when in connection with an inclined boom.

The bucket is mounted on three wide cast steel wheels, supported by steel bearings and are built of this description in the following sizes, 13, 20, 30, 40, 50, 60, and 70 cubic feet capacity.

Weights, demensions and prices will be furnished upon application.

TOGGLE IRONS, BANDS, ETC.



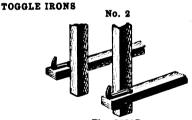




Fig. 2811A

Fig. 2811B TOGGLE IRONS

Fig. 2811C

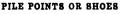
The modern method, and one which has been generally adopted, consists of a channel iron liner protecting the entire face and corners of the leaders. These channel irons are obtained in full lengths, avoiding joints, require few bolts and their use adds materially to the strength of the leaders as well as affording a perfect protection to the woodwork.

| Drop Hammerpounds | 500 to 800 | 1000 to 1200 | 1500 to 2500 | Over 2500 |
|-----------------------------------|-----------------------------------|--------------|--------------|-----------|
| Opening, No. 1 Togglesinches | 13 $6\frac{1}{2}$ 3.50 1.75 | 18 | 22 | 26 |
| Center of Leaders to Hook No. 2 " | | 9 | 11 | 13 |
| Price, No. 1, with Boltsper pair | | 5.75 | 8.00 | 9.25 |
| "No. 2." " | | 2.25 | 3.00 | 3.60 |

NORWAY IRON PILE BANDS

Made only to order and recommended Norway iron for this purpose. Although more expensive in first cost they are much less liable to breakage and are much cheaper in the long run then when made of ordinary iron.

| Diameterinches | 11 | 12 | 13 | 14 | 15 | 16 |
|--|------|------|------|------|------|------|
| Price, 34 x 3 inches each " 1 x 2½ " " " 1 x 3 " " | 2.00 | 2.25 | 2.50 | 2.65 | 2.85 | 3.05 |
| | 2.10 | 2.35 | 2.65 | 2.75 | 3.00 | 3.25 |
| | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 |



PILE HEAD COVER









Fig. 2811D

Fig. 2811E

Fig. 2811F

Fig. 2811G

PILE POINTS OR SHOES

These sizes will do for piles of much larger size, as the piles should be tapered in to fit straps. Spikes are included in prices.

| Size inches | 4 x 4 | 5 x 5 | 6 x 6 | 9 x 21/2 | 9 x 3 | 9 x 3½ | 6 Round | 8 Round | 10 Round |
|----------------------------|-------|-------|-------|-----------|------------|------------|------------|------------|-------------|
| Weight pounds Priceeach | | | | 17 .85 | 25 1.00 | 33 1.25 | 35 1.15 | 78 2.25 | 150 3.50 |

PILE HEAD COVERS

To protect pile heads from the weather, and at the same time serve as a very good advertisement. Name will be cast in an order of two dozen or more.

| Diameterinches | 111/2 | 131/2 |
|----------------|-------|-------|
| Priceeach | .60 | .75 |

Complete pile driver outfits furnished. Prices on application.

DRAG SCRAPERS

THE BOSS SOLID STEEL SCRAPERS



Boss Scrapers are made from heavy plates of specially hardened steel and are stamped from one sheet without joint or rivet. Owing to the sharp rounded nose of this scraper it will enter the ground more readily than other makes. The handles are hardwood.

| Number | Capacity Cubic Feet | Weight Pounds | Weight withRunners Pounds | Weight with Steel Bottom Plate Pounds | Price Each | Price with Runners Each | Price with Steel Bottom Plate, Each |
|----------|------------------------|------------------|---------------------------------|--|---------------|-------------------------------|---|
| 1 | 7 | 94 | 100 | 106 | | | |
| 2 | 5 | 82 | 90 | 94 | | | |
| 3 | 3 | 68 | 74 | 7 8 | | | |

No. 3 Boss Ditching Scrapers are made with handle sockets on the side of bowl. The size and thickness of bowl is the same as Columbus No. 3.

THE COLUMBUS SOLID STEEL SCRAPERS



Fig. 1375C

Fig. 1375D

| Number | Capacity Cubic Feet | | Width Inches | Depth Inches | Weight Pounds | Weight with Runners Pounds | Weight with Steel Bot- tom Plate Pounds | Price Each | Price with Runners Each | Price with Steel Bot- tom Plate Each |
|--------|---------------------------|-----|-----------------|-----------------|------------------|-------------------------------------|---|---------------|----------------------------------|--|
| 1 | 7 | 34 | 33 | 10 | 101 | 109 | 114 | | | |
| 2 | 5 | 31½ | . 291/2 | 9 | 89 | 97 | 101 | | | |
| 3 | 3 | 32 | 26 | $9\frac{1}{2}$ | 75 | 8117 | $91\frac{1}{2}$ | | | |

No. 1 Columbus Scrapers are used for long hauls or down grade; No. 2 for ordinary grading, farm, road or township work.

No. 3 Columbus Ditching Scrapers are made with extra long nose and sharpened cutting edge, entering the ground as readily as a plow. They are intended for narrow ditch work with one horse.



SCRAPERS AND PLOWS

K. & J. PRESSED BOWL WHEEL SCRAPERS

WITH IMPROVED SAND-PROOF HUB WHEELS WITH MALLEABLE IRON HUBS AND REMOVABLE AXLE BOXES

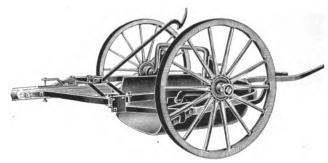


Fig. 1376A

| | DIM | ENSIONS O | of Box, In | CHES | Diameter | Width of | Capacity, | Weight. |
|----------|--------------------|--------------------|------------------|------------------------|----------------------|------------------|------------|---------|
| Number | L'gth at Bottom | Width at Bottom | Depth at Back | Tires | of Wheels. Inches | Track, Inches | Cubic Feet | Pounds |
| 1 | 36 | 35 | 111/2 | 3 x 14 | 34 | 50 | 9 | 390 |
| 2 | 381/2 | 37 | 1312 | 3 x 1/4 | 40 | 55 | 13 | 644 |
| 3 | 46 | 42 | 16 | $3 \times \frac{1}{4}$ | 46 | 62 | 17 | 772 |

The above scrapers also furnished with sand-proof malleable hubs.

GREAT WESTERN GRADING PLOWS

TWO-HORSE PLOW

No. 105

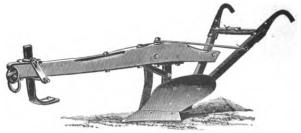


Fig. 1376B

| Number | Horse Power | Weight, Pounds | Price, Each | LANDSIDE POINTS | | |
|--------|--------------|----------------|-------------|-----------------|------------|--|
| | Tiorse Tower | Weight, Founds | | Weight, Pounds | Price Each | |
| 106 | 2 to 4 | 150 | | 26 | | |
| 105 | 4 " 6 | 175 | | 24 | | |
| 101 | 6 " 8 | 228 | | 35 | | |
| 103 | 12 " 14 | 280 | | 50 | | |

SQUARE BOWL WHEEL SCRAPERS

WESTERN PATTERN

WITH METAL HUR WHEELS

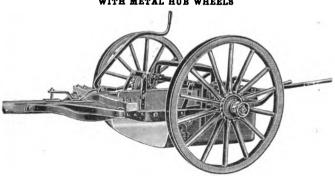


Fig. 9511A

The hubs are sand-proof and have removable boxings which can be readily replaced when worn.

| | Dia | METER OF | Box, Inc | HES | Diameter | Width | Capacity | Wolahi | |
|--------------------------|------------------------------|------------------|------------------|-------------------|--------------------|-----------------|---------------|------------------|--|
| Number | Length at Bottom | Width at Back | Depth at Back | Depth at Front | of Wheel Inches | Track Inches | Cubic Feet | Weight Pounds | |
| 1 | 36 | 361/2 | 1214 | 1114 | 38 | 53 | 9 | 497 | |
| $rac{2}{2 	extstyle 2}$ | 363 <u>4</u> 393 <u>4</u> | 3814 | 13½ 13¼ | $12\frac{1}{5}$ | 40 44 | 56 56 | 12 | 675 750 | |
| 3 ~ | 411/2 | 44 | 15 | 1444 | 46 | 6112 | 16 | 815 | |

AUTOMATIC END-GATE WITHOUT A CHAIN



Our Square Bowl Wheel Scraper is supplied with our new automatic end-gate which is the only practical end-gate ever applied to this type of scraper. This end-gate is operated by an iron arm which is hinge-bolted to the dumping lever just back of the point where the lever is turned horizontally for connection with the axle.

The arm is curved up from the hinge bolt and the opposite end is hook-shaped. This hook catches a heavy pocket on the end-gate. The arm is slotted at the back and a curved trigger is hinge-bolted within the slot with the curve resting on the flat top of the dumping lever, and perfectly free to turn on its bolt. This trigger is so shaped that when the scraper is brought down from the trail position to the filling position, it lets the arm down so that the hook catches the pocket on the end-gate and pulls the end-gate up out of the way of loading.

A dog on the arm prevents the end-gate from dropping against the axle and overbalancing. When the lever is raised, bringing the bowl to the carrying position, the trigger so places itself as to force the hook above the pocket releasing the end-gate and allowing it to fall of its own weight. The operation of the end-gate is absolutely automatic and it always works very readily. It is not necessary to touch the trigger as it assumes the proper positions of itself from the positions of the dumping lever. This end-gate works freely and avoids the slow dragging of a chain over a pulley. The drop also gives it a shearing force enabling it to cut through clods and to close up much more readily than the chain type which is let down slowly and is apt to rest on top of the load until jarred into place.

WAGONS

1½ YARD DUMPING WITH FLARING UPPER BOX



Fig. 443A

This Dumper is used by contractors for general work, being equally efficient for handling any material. The Foot Dump releases the load while team is on the move. No danger of dumping in transit, leakage or delay. The front wheels turn under and the wagon turns in its own length. The weight is divided over all four wheels and it is of easy operation. The removal of the upper box makes the wagon one yard capacity.

The body is hard, tough birch, banded with steel around the edges of body and upper box and stands 4 feet 8 inches high over all. The front wheels are

3 feet 1 inch, and the rear, 4 feet 1 inch high, and have A-grade, second growth, white oak spokes; XXX grade second growth, white oak rims riveted at each spoke, bound with 54 x 3 or 4 inch steel tires, with birch hubs fitted on steel axles, 2 x 10 inches in front and 21/8 x 10 inches rear. Furnished with spring seat, either drop or stiff pole and either neckyoke, chains, spreader, or Boston backers, as desired. Weighs 1,800 pounds and tracks 4 feet 6 inches or 4 feet 10 inches, center to center of tire. Prices on application.

2 YARD GRADING WITH EXTENSION UPPER BOX

The cut shows the regular 2-yard Wagon with extension upper box, increasing capacity to 3 yards, for light material, such as cinders, ashes, and ref-When used as a 2-yard wagon it is a favorite type for steam shovel, grade macadam, and general road work. It is the ideal wagon for road builders and brick pavers. It can be used to distribute the load without extra attachments. weight is properly distributed and the Wagon turns in its own Capacity is approximate, actual water measure-ment 51 cubic feet. Has birch



Fig. 443B

body banded with steel around the edge of body and upper box. Height 4 feet, 11 inches to top of flare. Has 3 feet, 1 inch high wheels in front and 4 feet, 1 inch high in rear. Made with A-grade second-growth, white oak spokes; XXX second-growth white oak rims, bound with $\frac{5}{6} \times 3$ or 4 inch steel tires, riveted at each spoke with birch hubs on $\frac{21}{6} \times 10$ inch steel axles in front and $\frac{21}{4} \times 10$ inch in back. Furnished with spring seat, either drop or stiff pole and either neckyoke, chains, spreader, or Boston backers as desired. Weighs 1900 pounds without the extension upper box to make it carry 3 yards — extension upper box weighs from 200 to 250 pounds — and tracks 4 foot 6 inches or 4 foot 10 inches center to center of tires. Price on application.

DUMP CARS

No. 05115 TWO-TON STEEL DUMP CAR



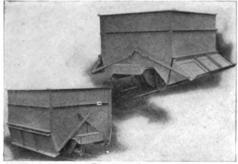




Fig. 5575A

No. 9985 SELF-DUMPING CARS





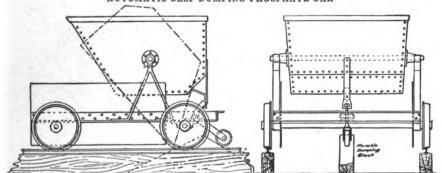


Fig. 5575D

This car is fitted with an automatic catch, one end of which secures the body of car to truck, and the opposite end carries a roller which strikes a movable dump block, as shown.

The car is intended to be hauled by a cable. The hopper is made of heavy steel plates, reinforced on the bottom with an extra plate.

The truck consists of angle irons. A fender is provided on each side of body to prevent contents falling beyond track.

Prices on application.

DUMP CARS

TWO-WAY DUMP CARS
CAPACITY: 14 CUBIC YARDS, LEVEL FULL

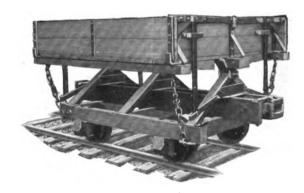
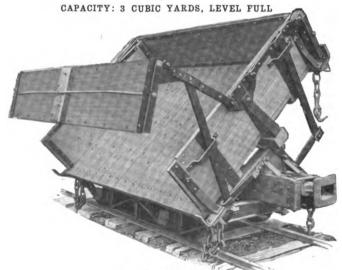


Fig. 2054A



CAPACITY: 114 CUBIC YARDS, LEVEL FULL

| CAPACITY. 1% CUBIC YARDS, LEVEL FOLL | | | | | | | | | |
|--------------------------------------|--|--------------------------|-------------------------|-----------|----------------------------|---------|---------|--------------------------|------------------|
| Dimensions of Bed Inside, Inches | Draw Floor Bar Inches | Rall to Top of Car | Wheel Base Inches | Wheels | Weight Wheels Pounds | Axles | Poor. | Gauge Track Inches | Approx. Wt. Lbs. |
| 71 , 72 14 | $egin{array}{ c c c c c c c c c c c c c c c c c c c$ | 541 <u>4</u> | 48 | 16 BDS | | | 2 5 x5# | 36 | 2300 |
| 96 72 1917 | 22.5 43.8 | 1 63 F | 78 | 16 | | 3 . rd. | | 36 | 4300 |

Price and other sizes on application.

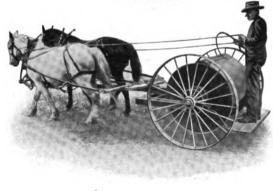
CONCRETE MIXERS AND SPREADERS

HAND BATCH

X-L-ALL MIXERS







Flg. 9430A

Fig. 9430B

| | Size of | Gauge | CAPA | CITY | Speed of Drum | Watesha | Size of | Price |
|----------|----------------|----------------------|-------------------------|------------------------|------------------|------------------|------------------|--------|
| Number | Cylinder | Steel in Cylinder | Cubic Feet per Batch | Cubic Yds. per Hour | Revolu- tions | Weight Pounds | Pulley Inches | Each |
| 1 Hand | 24 x 32 | 14 | 1 | 11/2 | 12 | 350 | | 35.00 |
| 2 Hand | 32×32 | 14 | 2 | 3 ~ | 12 | 500 | | 55.00 |
| 3 Hand | 32×42 | . 12 | 3 | 4 | 14 | 700 | | 60.00 |
| 4 Power | 32×42 | 12 | 3 | 5 | 15 | 1100 | 10 x 4 | 110.00 |
| Traction | 38 x 54 | 10 | 9 | 5 | 12-16 | 1850 | | 225.00 |

Power mixer has reversible gearing back geared 24 to 1.

These mixers are made with cast iron cylinder ends, the wings are sheet steel and can be removed, leaving the breaking knives attached to the end. The knives can also be removed if necessary. The material is turned over twice in one revolution of the drum, which has no cover, allowing the operator to see the batch without stopping the machine. A perforated pipe provided with a shut-off is placed directly over the drum, giving the operator absolute control of the water supply.

SPREADERS

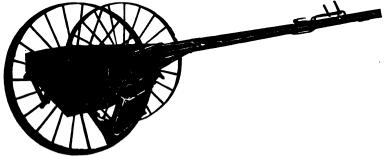


Fig. 9430C

| | | | - | | _ | | | | | - | | | |
|--------|----|------|-----|------|----|---------|------|-----|----|---|-----------|-------|--------|
| Capaci | ty | | ••• | | ٠. | | | ••• | | | eubie | yards | 34 |
| Price. | | | | | | | | | ٠. | | | .each | 110.00 |

SMITH CONCRETE MIXERS

WITH STEAM EQUIPMENT



Fig. 5338A

| New Number (1910 Model) | 10 | 11 | 12 | 13 | 14 | r8 |
|--|-------|-------|-------|-------|-------|---------|
| Former Number | 0 | 1 | 21/2 | 4 | 5 | 6 |
| Capacity per Batch, Cementcubic feet | 1 | 1 | 2 | 3 | 4 | 8 |
| " " " Sand " | 21/2 | 41/2 | 71/2 | 10 | 14 | 28 |
| " " Stone " | 5 | 9 | 15 | 20 | 28 | 56 |
| Total unmixed Batch " | 81/2 | 141/2 | 241/6 | 33 | 46 | 92 |
| Total mixed Batch " | 6 | 10 | 161/2 | 22 | 31 | 62 |
| Output (45 Batches), in unmixed | | | '- | | | l |
| material per hourcubic yards | 14 | 24 | 41 | 56 | 77 | 154 |
| Output (45 Batches), in loose mixed | 1 | | | ! | | 1 |
| material per hour " | 9 | 161/2 | 271/2 | 37 | 52 | 104 |
| Horse Power required | 4 | 6 | 10 | 14 | 18 | 38 |
| Speed of Driving Pulleyrev. per minute | 218 | 180 | 162 | 160 | 125 | 98 |
| " " Drum " " | 18 | 16 | 14 | 12 | 11 | 91/4 |
| Size of Pulleysinches | 20x41 | 24x51 | 28x61 | 36x6} | 48x7} | 48x14 |
| Weight on Skids with Pulleypounds | 1700 | 2700 | 4400 | 6200 | 7800 | 15200 |
| " " " Engine " | 2100 | 3500 | 5500 | 7200 | 9300 | 18600 |
| " " " Engine and Boiler " | 3200 | 5200 | 7600 | 10300 | | |
| " " " Gasoline Engine " | 3000 | 4200 | 8200 | ١ | | |
| " Truck with Pulley or Gear " | 2200 | 3700 | 5500 | 7300 | | |
| " " " Engine " | 2600 | 4500 | 6600 | 8300 | | |
| " " " Engineand Boiler " | 3700 | 5700 | 8700 | 11400 | | |
| " " " Gasoline Engine " | 3500 | 5200 | 9300 | | | |
| " " Eng. Boiler and Power Charger " | 5300 | 8000 | 11800 | | | |

When ordering a motor driven mixer, purchaser should specify kind and voltage of current to be used. The buyer may mount his own motor, but it gears are ordered, must state speed of motor, diameter of shaft, and width of key seat, so that we can furnish the proper gears. Prices on application.

SMITH CONCRETE MIXERS

STANDARD EQUIPMENT WITH GASOLINE POWER

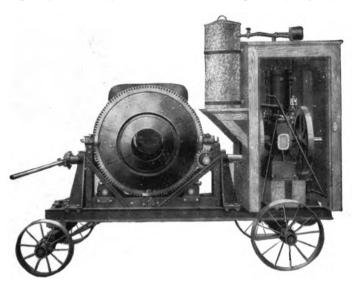


Fig. 8349A

STANDARD EQUIPMENT ON SKIDS WITH ENGINE

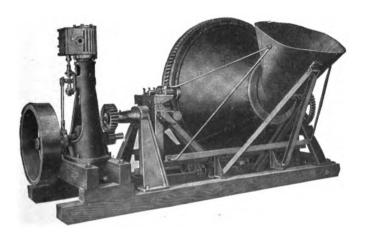


Fig. 8349B

CHAMPION STEEL ROCK CRUSHERS

No. 15 PORTABLE CRUSHING PLANT
Showing Method of Raising and Lowering Lower End of Elevator



Fig. 5088A

SECTIONAL VIEW OF No. 3 AND No. 4 CRUSHERS

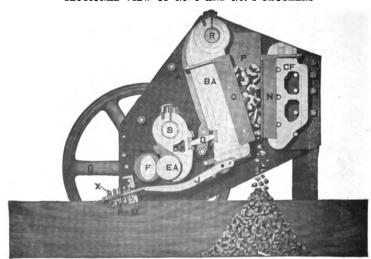


Fig. 5088B

For description, etc., send for special catalogue.

CHAMPION REVOLVING SCREENS

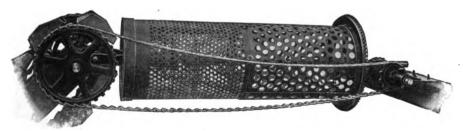
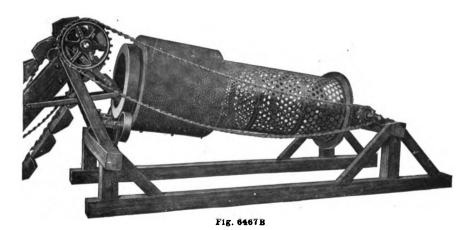


Fig. 6467 A



The above illustrations show the usual styles of revolving screens used for portable and fixed crusher plants. These screens are made in sections, each section being two, three or four feet in length, according to the special conditions, bolted and clamped together, and when it is necessary to renew a particular section it can be easily taken out and a new one inserted.

The screen shown in the upper illustration is usually used with No. 3 and 4 crusher.

The screen shown in lower illustration is furnished with the No. 5 crusher, and frequently with the No. 4 crusher.

These screens vary in size, from 24 inches diameter and 6 feet long to 60 inches diameter and 15 feet long.

The standard size chute screen is 24 inches wide and perforated with one-inch holes; it can be made almost any length with any size holes.

Prices furnished on receipt of specifications.



GOLD MEDAL LAND AND LAWN ROLLERS

STEEL LAND ROLLERS

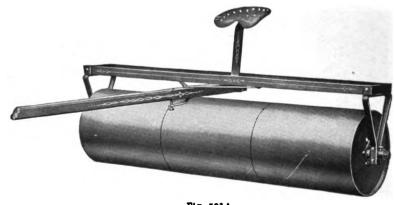


Fig. 501A

| Number | Diameter Inches | Width of Face Inches | Number of Sections | Weight Pounds | Price Each |
|------------|---|---|-----------------------|------------------|----------------|
| S17 S18 | $\begin{array}{c} 24 \\ 24 \end{array}$ | $\begin{array}{c} 72 \\ 84 \end{array}$ | | 485 540 | 28.00 30.00 |
| S19 | 24 | 96 | 3 . | 585 | 32.00 |

Whiffletrees and Neck Yoke, 3.00 extra. Shafts for one horse, 1.00 extra.

ONE-HORSE CAST IRON LAND ROLLERS

| 460 | 20 | 48 | 8 | 4 | 950 | 61.00 |
|-----|----|----|---|---|------|-------|
| 462 | 24 | 48 | 8 | 4 | 1200 | 76.00 |
| | | | | | | |



Fig. 501B

NEW LAWN ROLLERS

Roller Bearings

| Number | Diameter Inches | Width of Face Inches | Number of Sections | Weight Pounds | Price Each |
|--------|--------------------|----------------------------|--------------------------|------------------|---------------|
| 402 | 15 | 24 | 3 | 200 | 12.50 |
| 404 | 20 | 20 | 2 | 250 | 15.50 |
| 407 | 20 | 24 | 2 | 300 | 18.50 |
| 410 | 24 | 24 | 2 | 450 | 27.50 |

Send for special catalogue. We can furnish land rollers in all sizes and styles varying from 150 to 12000 pounds.

Smooth on face, silver finish, outer edge rounded.



WHEELBARROWS, ETC.

WHEELBARROWS

CLIMAX BOLTED

PALMETTO





Fig. 9934A

CLIMAX BOLTED

| Price. | with | Improved 16-inch Sectional Felloe Wheelper dozen | 30.00 |
|--------|------|--|-------|
| " | 44 | " 18 " Iron Hub Wheel" " | 31.50 |
| 66 | 44 | Patent Steel Wheel " | 33.00 |

Full size tray, with edges shaved, bolted to legs, and well bolted and braced in front. Legs gained and bolted to handles. Handles and legs of selected hard wood. Wheels painted.

PALMETTO

| Price, with Extra Heav | y Iron Hub | Wheel | per dozen | 48.00 |
|------------------------|------------|-------|-----------|-------|

This is the strongest canal barrow made. All braces double width and double bolted and all parts made of selected timber.

PHOSPHATE WHEELBARROW







Fig. 9934C

Pig. 9934D

PHOSPHATE WHEELBARROWS

| SIZE TRA | y, Inches | Depth Inches | Weight | Price | |
|----------|------------|-----------------|--------|-----------|--|
| Тор | Top Bottom | | Pounds | per Dozen | |
| 33x30 | 18x19 | 14 | 80 | 84.00 | |

Made extra strong by banding the corners with sheet iron. Securely riveted and has strong iron hub wheel.

FERTILIZER CARTS

| . Size Box | , Inches | Depth | WHEELS | , Inches | Axle | Price Each | |
|------------|----------|--------|----------|----------|--------|---------------|--|
| Top ' | Bottom | Inches | Diameter | Tread | Inches | | |
| 36x46½ | 22x24 | 18 | 36 | 11/2 | 11/4 | 33.00 | |

Has hard wood box and Sarven wheels.

COLUMBUS WHEELBARROWS

TUBULAR STEEL





COAL BARROW

Fig. 7173A

Fig. 7173B

These barrows have tubular iron frames, steel trays and the well-known Lewis pattern steel wheels.

The Lewis wheels are so constructed, having the spokes dove-tailed in the flanges against the hub, and secured by a head on the outer and a shoulder on the inner side of the tire, thus combining tension and compression strength, that it is impossible for tire to come off, or spokes to become loosened.

DIRT BARROWS

| No. | Gauge of Tray No. | Size of Wheel Inches | Tire Inches | Length on Top Inches | Width on Top Inches | Depth at Wheel Inches | Depth at Handle Inches | Langth | Height | Capacity Cubic Feet | Welght Pounds | Price Each |
|------------------------------------|-------------------------|----------------------------|----------------------------|----------------------------|---------------------------|--------------------------------|---------------------------------|-------------------|-------------------|---------------------------|------------------|---------------|
| 4 41 5 | 15 14 14 | 16½ 16½ 16½ | 1½ x ½ 1½ x ¾ 1½ x ¾ | 32 32 35 <u>1</u> | 29 29 28½ | 7 7 8½ | 5 5 6 | 67½ 67½ 67½ | 19½ 19½ 21½ | 3 3 4 | 75 76⅓ 79 | |
| MINING AND GENERAL PURPOSE BARROWS | | | | | | | | | | | | |
| 6 7 | 14 14 | 16½ 16½ | 14 x 8 14 x 8 | 32 35 ½ | 29 28 ½ | 7 8± | 5 6 | 67± 67± | 19½ 21½ | 3 4 | 79‡ 84 | |
| FOUNDRY BARROWS | | | | | | | | | | | | |
| 8 | 12 12 | 16½ 16½ | 1# x # 1# x # | 32 351 | 23 28½ | 7 8 <u>ֈ</u> | 5 6 | 67± 67± | 19½ 21½ | 3 4 | 89 98 | |
| | COAL BARROWS | | | | | | | | | | | |

| | | | | | | | |
|------|------|------|------|------|--------|------------|--|
| | 1 | | | | 4 6 | 84 103‡ | |

COKE BARROWS

| | | | | | | | | | 1 | | | T |
|----|-----|-----|-------------|-----|-----|---------|---|-----|-------|---|----|---|
| 19 | 15 | 163 | 19 v # | 411 | 33 | 111 | 8 | 673 | 253 | 6 | 94 | ĺ |
| 1 | 711 | 102 | 1 1 1 2 2 1 | 11. | 000 | * * * 2 | | 0.5 | 20.70 | | | 1 |
| | | | | | | | | | | | | |

CAPACITIES OF COAL AND COKE BARROWS

| Number | 7 | 10 | 12 |
|------------|----------------|----------------|-------------------|
| Capacities | 215 to 250 | 350 | 5 Bushels of Coke |
| | Pounds of Coal | Pounds of Coal | or Charcoal |

Greatest width of all barrows is width on top of tray. All the above barrows have malleable hub, $\frac{1}{2}$ inch round steel spokes and $\frac{5}{8}$ inch axle bolts.



WHEELBARROWS AND CARTS

WHEELBARROWS

K & J CONCRETE

COLUMBUS CONTRACTOR





CONCRETE WHEELBARROWS

The shovel-shaped dash adds another practical advantage to the "K & J" tray shape. A pouring channel is so formed which deposits flowing material in compact form at the exact point desired.

| | Size | OF TRAY | , Inches | | Diam. | Size | Weight | CAPA CUBIC | | Price |
|--------|-------|----------------------|---------------------|--------------------------------|-----------------|----------------|--------|--------------------------------|------|--------------|
| Length | Width | Depth at Front | Depth at Back | Length of Slope at Front | Wheel Inches | Tire Inches | Pounds | Wet Mor- tar or Concrete | Dirt | per Dozen |
| 373/4 | 251/2 | 13 | 814 | 1914 | 161/2 | 1½x3 8 | 731 2 | $\overline{2}$ | 4 | |

COLUMBUS CONTRACTOR WHEELBARROWS

The "Columbus" Steel Tray Wheelbarrows are also supplied with angle iron legs and braces. These legs are cross braced with angle iron and are further reinforced by a V-shaped steel brace which extends from the handles at each side, and is bolted to the cross brace.

| | | SIZE OF TR | AY, INCHES | | Greatest | Greatest | Canacity | | Price |
|-----|------------------|-----------------|----------------------|------------------------|------------------|----------------------------|----------|------------------|--------------|
| No. | Length on Top | Width on Top | Depth at Wheel | Depth at Handle• | Length Inches | Greatest Width Inches Feet | | Weight Pounds | per Dozen |
| 2A | 351/2 | 281/2 | 81/2 | 6 | 65 | 201/2 | 4 | 69 | |



COLUMBUS CONCRETE CARTS

For Contractors, Cement Workers, Etc.

The bowl is so hung that it can be turned bottom up, making it especially convenient for laying the concrete base for sidewalks, reservoir bottoms and floors for reinforced concrete buildings.

Fig. 7060C

| Diameter of | Size of Tire | Gauge of Steel | Size o | F BODY, I | NCHES | Axle | Weight | Capacity Cubic Feet | Price Each |
|------------------|-----------------|-------------------|--------|-----------|-------|--------|--------|---------------------------|---------------|
| Wheels Inches | Inches | in Tray Number | Length | Depth | Width | Inches | Pounds | | |
| 42 | 2 x 1/2 | 12 | 381/6 | 20 | 20 | 11/4 | 240 | 6 | |

In addition to this advantage of larger loads hauled per man, there is an economic advantage in being able to discharge the batch from a concrete mixer in much less time where carts are used than where wheelbarrows are used. In fact, a mixer can be discharged into these carts in one-third the time required with wheelbarrows.

WHEELBARROWS AND DUMP CARTS

WHEELBARROWS

COAL OR ORE AND SMELTER BARROW

CHARGING BARROW





Pig. 2056A

COAL BARROWS

Pig. 2056B

| GAUG | E OF | | | | | SIZE OF | | of | CAI | PACITY | , Pou | NDS | | |
|-----------|-------------------|---------------------|--------------|------------|---------------------------------------|----------------|------------|------------------------------|--------------|-----------------|--------------|-----------------|------------------|---------------|
| 7 | | heel | 8 | hes | hes | - INCI | 1E8 | epth | Nut | COAL | LUMP | COAL | | |
| Bottom ar | Sides and Back | Size of W Inches | Tire, Inches | Spoke, Inc | Axle, Incl | Top | Bottom | Greatest D Tray Inches | Even Full | Heaping Full | Even Full | Heaping Full | Welght Pounds | Price Each |
| 10 | 12 | 20 | 2 | 18 | $\frac{1\frac{1}{2}x}{38\frac{1}{2}}$ | 44x32½ x39½ | 20½x 21 | 161/4 | 400 | 480 | 450 | 650 | 274 | |

COAL OR ORE AND SMELTER BARROWS

| 3/16 | 10 | 20 | 214 x3/8 | 5/8 11/2 38 | x 44x324 x39½ | 20½x 21 | 1412 | 400 | 480 | 450 | 650 | 370 | |
|------|----|----|-------------|----------------|------------------|------------|------|-----|-----|-----|-----|-----|--|

Extra tire shrunk on.

CHARGING BARROWS

| 12 | 12 | 34 | 2x 9 | | 44x26¾x20 | Iron Ore. Coal | 1500 | 385 | |
|----|----|----|------|----|-----------|-----------------------|------|-----|--|
| | | | 81 | 11 | | Coai | 000 | | |

We can furnish two heavier sizes of this design; they have drag wheel instead of legs.

DUMP CARTS



Fig. 2056C

Prices on application.

TRUCKS

FACTORY TRUCKS

Nos. 1, 2, 3, and 4



Fig. 3498A

| Number | Width of Truck Feet | Length between Stakes Feet | Diameter of Wheels Inches | Diameter of Casters Inches | Weight Pounds | Stakes | Price with End Racks per Dozen | |
|---------|---------------------------|-------------------------------------|---------------------------------|----------------------------------|------------------|--------|--------------------------------------|---------|
| 1 | 2 | 4 | 12 | 7 | 140 | 130.00 | 166.00 | 84.00 |
| $ar{2}$ | 2 | 4 | 16 | 7 | 170 | 144.00 | 180.00 | - 96.00 |
| 3 | 3 | 5 | 12 | 7 | 195 | 154.00 | 190.00 | 90.00 |
| 4 | 3 | 5 | 16 | 7 | 215 | 168.00 | 204.00 | 100.00 |

Made of hardwood for heavy work in woodworking plants. Sides of 2-inch hardwood dressed. Stakes of rock elm, oak, or hickory. Platforms of 1-inch maple or oak dressed. Turned bearings. Steel stake pockets.

PLANING MILL TRUCKS



Fig. 3498B

Price, without frame, two wheels only.....each 25.00

This truck has become very popular in lumber yards, planing mill and box factories, and is acknowledged by those handling lumber to be most economical and satisfactory. In using these the lumber is handled from the truck, and is not dumped as in the old method, and thus avoids breaking, splitting, etc., and is much handier. The frame is 4 feet long, 3 feet wide, strongly mortised and bolted together. 36-inch wheels, 2-inch axle, 4 feet 9 inches long.

We have in connection with our business an up-to-date machine shop,

TRUCKS

WAREHOUSE AND STORE TRUCKS

WESTERN PATTERN

Mos Oto 4



Fig. 35A

Nos. 0 to 4



Fig. 35B

| _ | Length | Length | Width | Size | WEIGHT | , Pounds | PRICE | Елсн |
|--------|-------------------|----------------------|--------|-------------------------|----------------|----------------|----------------|----------------|
| Number | of Nose Inches | of Handles Inches | Inches | of Wheel Inches | Half Ironed | Full Ironed | Haif Ironed | Full Ironed |
| 0 | 4 | 42 | 18 | 6 x2 | 39 | 44 | 6.00 | 7.00 |
| 1 . | 4 | 48 | 18 | 7 x2 | 44 | 47 | 7.00 | 8.00 |
| 2 | 5 | 52 | 20 | $8 \times 2\frac{1}{2}$ | 57 | 63 | 9.00 | 10.50 |
| 3 | 5 | . 56 | 22 | $81/2 \times 21/2$ | 71 | 80 | 13.00 | 15.00 |
| 4 | 6 | 60 | 24 | $10\frac{1}{2}x^{2}$ | 87 | 94 | 16.00 | 18.50 |

STEAMBOAT AND BAG TRUCKS

STEAMBOAT TRUCK



Fig. 35C

BAG TRUCK Nos. 1 and 3



Fig. 35D

| Number | Length of Nose Inches | Length of Handles Inches | Width at Nose Inches | Width 36 inch from Nose, Inches | Size of Wheel Inches | Weight Pounds | Price Each |
|-----------|-----------------------------|--------------------------------|----------------------------|---------------------------------------|----------------------------|------------------|---------------|
| Steamboat | 9 | 60 | 17 | 2034 | 12x3 | 135 | 26.00 |
| Bag No. 1 | $4\frac{1}{2}$ | 42 | 11 | 1737 | 6x13% | 30 | 5.00 |
| Bag No. 3 | 81/2 | 48 | 15 | 21 | 7x2 | 60 | 9.00 |

TRUCKS

DAISY TRUCK



BARREL TRUCK WESTERN PATTERN Nos. 1 to 4



BARREL TRUCK ALL IRON No. 0



Fig. 5695A

Fig. 5695B DAISY TRUCKS

Fig. 5695C

| Number | Length of | Width at | Width at | Diameter | Weight | Pric | E EACH |
|--------|-------------------|----------------|---------------------|--------------------|--------|---------------|------------------------|
| Number | Handles Inches | Nose Inches | Upper Bar Inches | of Wheel Inches | Pounds | Iron Wheel | Rubber Tired Wheels |
| 0 | 46 | 12 | 171/2 | 6 | 30 | 5.00 | 6.50 |

BARREL TRUCKS, WESTERN PATTERN

| Number | Length of Handles Inches | Width Inches | Diameter of Wheel Inches | Weight Pounds Approx. | Price Each |
|--------|--------------------------------|-----------------|--------------------------------|-----------------------------|---------------|
| 1 - | 48 | 18 | 7 | 55 | 9 00 |
| 2 | 52 | 20 | 8 | 75 | 11.00 |
| 3 | 56 | 22 | 81/2 | 90 | 16 00 |
| 4 | - 60 | 24 | 101/2 | 117 | 21 00 |

BARREL TRUCKS, ALL IRON

| Number | Length Over All Inches | Width Inches | Diameter of Handle Inches | Width of Nose Inches | Diameter of Wheel Inches | Weight Pounds Approx. | Price Each |
|--------|------------------------------|-----------------|---------------------------------|----------------------------|--------------------------------|-----------------------------|---------------|
| 0 | 45 | 26 | 7/8 | 131/2 | $7\frac{1}{2}$ | 40 | 12.00 |

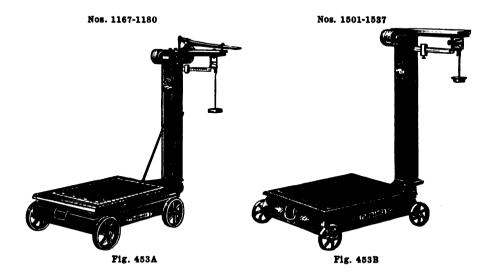


| Pio | 5695 | П |
|-----|------|---|

| Length Feet | Kind | Size of Side Rails, Inches | No. of Cross Bars | Weight Pounds | Price per Foot |
|----------------|-------|------------------------------------|----------------------|------------------|-------------------|
| 6 | Light | 114x234 | 2 | 24 | 1.00 |
| -6 | Heavy | 13/4x31/2 | 2 | 40 | 1.25 |
| 7 | Light | $1\frac{1}{4} \times 2\frac{3}{4}$ | 2 | 28 | 1.00 |
| 7 | Heavy | $1\frac{3}{4}x3\frac{3}{4}$ | 2 | 45 | 1.25 |
| 8 | Light | $1\frac{1}{2}$ x $2\frac{3}{4}$ | 2 | 30 | 1.00 |
| 8 | Heavy | $13\sqrt{x}3\sqrt[3]{4}$ | 2 | 52 | 1.25 |
| 9 | Heavy | $13_4 \times 33_4$ | 3 | 63 | 1.25 |
| 10 | Heavy | 134 54 | 3 | 70 | 1.25 |
| 12 | Heavy | 134 x414 | 4 | 85 | 1.25 |

Any size under 6 feet same price as 6 feet.

PORTABLE PLATFORM



LONG PLATFORM WITH DROP LEVER

The drop lever relieves the bearings from wear and strain except during the actual process of weighing. Especially adapted for weighing heavy boxes or other compact articles where there is danger of breaking the mechanism of the scale in the act of loading or unloading. 1500 pounds capacity and larger have pillars braced with iron.

| Number | | | | | | 1174 | | | 1180 |
|---|--------|---------------------------------|---------|--------|----------|----------|-------|---------|---------|
| Capacitypounds Bize Platform .in. Priceeach | 3000x½ | 2500x ¹ ₂ | 2000x15 | 1500x½ | 1200x1/2 | 1000x1/2 | 800x½ | 600x1/4 | 400x1/4 |
| | 26x34 | 26x34 | 25x32 | 21x28 | 20x28 | 18x27 | 17x26 | 16x25 | 16x22 |

SQUARE PLATFORM, WITH WHEELS

| Number | 1501 | 1503 | 1505 | 1507 | 1509 |
|---|------------------|-----------------|-----------------|-------------------|-------------------|
| Capacity pounds Size Platform inches | 600x 14 23x23 | 1000x½ 25x25 | 1200x½ 27x27 | 1500x1/2 29x29 | 2000x1/2 31x31 |
| Priceeach | 35.00 | 45.00 | 53.00 | 60.00 | 80.00 |

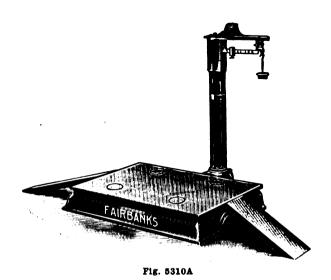
SQUARE PLATFORM, WITH WHEELS AND BAG RACKS

| Number | 1529 | 1531 | 1533 | 1535 | 1537 |
|--------------------------------------|----------------|----------------|--------|----------|----------|
| Capacity pounds Size Platform inches | 600x14 | 1000x12 | 1200x½ | 1500x1/2 | 2000x1/4 |
| Price | 23x23 38.50 | 25x25 49.00 | 57.00 | 64.50 | 85.00 |

Complete scale catalogue sent upon request.

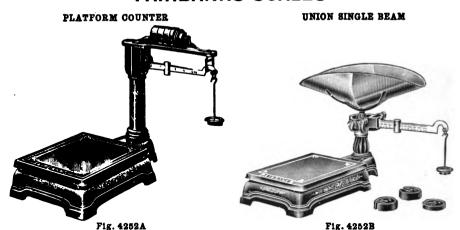


WHEELBARROW



| Number | Description | Capacity Pounds | Size of Platform Inches | Price Each |
|--------|---------------------------------------|--------------------|-------------------------------|---------------|
| 1380 | Without wheels | 1500 x 1 | 42 x 30 | 80.00 |
| 1381 | With wheels | 1500 x 1 | 42 x 30° | 85.00 |
| 1382 | Without wheels | 1000 x 1 | 42 x 30 | 70.00 |
| *1383 | Without wheels and with quick weigher | 1000 x 1 | 42 x 30 | 110.00 |
| 1384 | With wheels | 1000 x 1 | 42 x 30 | 75.00 |
| *1385 | With wheels and quick weigher | 1000 x 1 | 42 x 30 | 115.00 |
| 1386 | "H" pattern without wheels | 1000 x 1 | 39 x 30 | 60 00 |
| 1388 | " " with wheels | 1000 x 1 | 39 x 30 | 65.00 |
| 1389 | Without wheels | 2000 x 1 | 44 x 35 | 93.00 |
| 1390 | With wheels | 2000 x 1 | 44 x 35 | 100.00 |
| 1391 | Without wheels | 2500 x 1 | 45 x 36 | 115.00 |
| 1393 | With wheels | 2500 x 1 | 45 x 36 | 125.00 |

*Nos. 1383 and 1385 are with quick weighing attachment, the indicator of which shows immediately the weight of the load. The indicator is graduated 200 x 2 pounds, and is used for large loads by adding weights to counterpoise, while the tare is taken on the beam itself. Price includes a set of inclines.



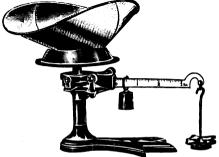
PLATFORM COUNTER

| | | | | | |
|------------------------|---------------------------|-------------|--------------------------------------|--------------------------------------|-------------|
| Number | 528 | 1212 | 1216 | 1220 | 1238 |
| Capacitypounds | 200 x 1 oz. | 300 x 2 oz. | 300 x 1/4 oz. | $300 \times \frac{1}{4} \text{ oz.}$ | 3200x14 oz. |
| Size, Platforminches | $10\frac{1}{2} \times 14$ | 13½ x 19½ | $13\frac{1}{2} \times 19\frac{1}{2}$ | 131/2 x 191/2 | 13½ x 19½ |
| Price, Single Beameach | 16.00 | 19.00 | 24.00 | 35.00 | 50.00 |
| " Double " " | 20.00 | 23.00 | 28.00 | 39.00 | 54.00 |

No. 1216 is intended for weighing silk and other fine goods. No. 1220 is the same except that it has brass weights and counterpoise. No. 1238 is a silver bullion scale, has brass Troy weights and counterpoise, and is graduated to one-quarter ounces. The other modifications may be graduated to one ounce without extra charge, if specially ordered.

UNION 502 504 Number 500 506 508 510 $51\overline{2}$ 514 Kind of Scoop Tin Brass Tin Brass Tin Brass Tin Brass " Beam Single Single Double Double Single Double Double Single Platforms.....number 1 2 Price..... each | 14.00 | 15.00 15.0016.00 14.50 15.50 15.50

These scales have a capacity of thirty pounds by one-half ounces in the scoop and 240 pounds by 14 pounds on the large platform which measures 101/2x131/4 inches.



| F12. | 4252C | |
|------|-------|--|

540 536 538 539 Number Capacity . pounds 63 63 63 63 Graduated ounces 12 $T_{in}^{1/2}$ 1/2 Tin Kind of Scoop . . Brass None " "Beam. Single Double Single Single Price.... cach 13.00 12.00 13.5010.75Number 542587 589 63 63 Capacity . pounds 63 Graduated ounces 1,5 15 1/2 Kind of Scoop . . Brass Iron Iron " Geam . . Single Double Double Price each 14.50 16.00 17.00

GROCERS' SCALES

Complete scale catalogue sent upon request.

WAGON AND STOCK



Fig. 4197A

Wagon Scales are not only made of the sizes and capacities shown, but the dimensions may be varied somewhat without adding to the cost of the scale.

Special scales can be adaped to special situations, and extension levers can be provided to carry the beam farther from the platform of the scale, placing it in an office, if desired. The distance from the platform to the beam may be extended up to 20 feet at a price proportionate to the length.

The scales may be fitted with various styles of beams.

All the prices are exclusive of timber and foundation, which are to be furnished by the purchaser.

| Number | Capacity | SIZE OF I | PLATFO | ORM | | PLATFORM | I | PRICE, BEA | MS |
|--------|----------|-----------|--------|-----|--------|----------|--------|------------|----------|
| ., | Tons | Length | Wie | ith | то Вел | M ROD | | LACH | |
| | | Feet | Ft. | In. | Feet | Inches | Single | Double | Compound |
| 1836 | 20 | 22 . | 7 | 3 | 3 | 10 | 520.00 | 535.00 | 550.00 |
| 1838 | 15 | 22 | 7 | 3 | 3 | 10 | 420.00 | 435.00 | 450.00 |
| 1806 | 10 | 22 | 10 | 4 | 2 | 1 | 365.00 | 380.00 | 395.00 |
| 1842 | 10 | 18 | 8 | 3 | 4 | 6 | 330.00 | 345.00 | 360.00 |
| 1845 | 8 | 18 | 8 | 3 | 4 | 6 | 315.00 | 330.00 | 345.00 |
| 1846 | 6 | 18 | 8 | 3 | 4 | 6 | 275.00 | 290.00 | 305.00 |
| 1924 | 15 | 14 | 8 | 4 | 2 | 1 | 390.00 | 405.00 | 420.00 |
| 1926 | 12 | 14 | 8 | 4 | 2 | 1 | 320.00 | 335.00 | 350.00 |
| 1928 | 10 | 14 | 8 | 5 | 2 | 1 | 300.00 | 315.00 | 330.00 |
| 1930 | 8 | 14 | 8 | 5 | 2 | 1 | 275.00 | 290.00 | 305.00 |
| 1932 | 6 | 14 | 8 | 5 | 2 | 1 | 250.00 | 265.00 | 280.00 |
| 1934 | 5 | 14 | 8 | 4 | 2 | 1 | 225.00 | 235.00 | 245.00 |
| 1936 | 4 | 14 | 8 | 4 | 2 | 1 | 200.00 | 210.00 | 220.00 |
| 1982 | 3 | 14 | 8 | | 1 | 2 | 175.00 | 185.00 | 195.00 |
| 2101 | 6 | 14 | 8 | | 2 | . 9 | 265.00 | 280.00 | 295.00 |
| 2110 | 6 | 14 | 8 | | 2 | 3 | 225.00 | 240.00 | 255.00 |
| 2112 | 5 | 14 | 8 | | 2 | 3 | 200.00 | 210.00 | 220.00 |
| 2114 | 4 | 14 | 8 | | 2 | 3 | 170.00 | 180.00 | 190.00 |
| 2116 | 3 | 14 | 8 | 1 | 2 | 3 | 145.00 | 155.00 | 165.00 |

Complete scale catalogue sent upon request.

FAIRBANKS SCALES MINERS' AND TRANSPORTATION



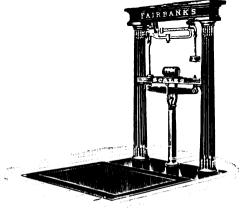
Fig. 8388A DORMANT, REQUIRING TIMBER

| No. | Capa- city Tons | Size of Platform | PRICE, EACH Single Double No. Beam Beam | Capa- city Tons | Size of Platform | PRICE. EACH Single Double Beam Beam | | |
|------|--------------------------------|-------------------|---|-----------------------|---------------------|---|--|--|
| 2198 | 2 | 4½ ft. x 3 ft. | 115.00 123.50 2162 | 5 | 7 ft. x 4 ft. 9 in. | 185.00 195.00 | | |
| 2176 | 2 | 6 " x 4 " 11 in. | 135.00143.50 2186 | 5 | 5 "x4 " | 185.00 195.00 | | |
| 2192 | 2 | 5 " x 4 " | 135.00 143.50 2184 | 6 | 71/3 " x 4 "8 in. | 205.00 215.00 | | |
| 2166 | 3 | 5 " x 4 " | 155.00 163.50 2158 | 8 | 7½ "x4 "8" | 240.00 250.00 | | |
| 2190 | 3 | 6 "x4" 11" | 155.00 163.50 2156 | 10 | | 270.00 280.00 | | |
| 2188 | 4 | 61 2 " x 4 " 10 " | 170.00 180.00 | | | | | |
| | PORTABLE, COMPLETE WITH TIMBER | | | | | | | |

| 2208 | 2 | 412 ft. x 3 ft. | 155.00 | 163.50 | 2200 | 3 | 6 ft. x 4 ft. 11 in. | 200.00 208.50 |
|------|---|------------------|--------|--------|------|---|----------------------|---------------|
| 2202 | 2 | 6 " x 4 " 11 in. | 180.00 | 188.50 | | | . | |

Prices for Dormant patterns are exclusive of timber and foundation. Single beams, 500 x 2 pounds; double beams 500 x 2 pounds on each bar.

DORMANT WAREHOUSE-DOUBLE BEAM With Tall Iron Pillar Outfit



| Number | 1046 D.B. | 1069 D.B. | 1048 D.R. |
|-------------------------|--------------------|----------------------|-----------|
| Capacity pounds | $5000x\frac{1}{2}$ | 4000x1/2 | 3500x1/2 |
| Platform inches | 48 x 48 | 48 x 48 | 42 x 44 |
| Platform to Pillar, in. | 23 | 23 | 12 |
| Price, Iron Wts. each | 180. 0 0 | 165.00 | 133.00 |
| Brass | 218.85 | 189.15 | 159.60 |
| Number | 1052 D.B. | 1067 D.B. | 1050 D.B. |
| Capacity pounds | $3500 x_{2}^{1}$ | 3000x1. | 2500x1/2 |
| Platforminches | 42 x 44 | 38 x 46 | 46 x 37 |
| " to Pillar " | 20 | 11 | 12 |
| Price, Iron Wts. each | 141.00 | 123.00 | 113.00 |
| · · Brass · · · | 167.60 | 140.85 | 132.25 |
| Number | 1065 D.B. | 1063 D.B. | 1061 D.B. |
| Capacity pounds | 2000x1/2 | $1500 x \frac{1}{2}$ | 1200x12 |
| Platform inches | 38 x 46 | 43 x 33 | 43 x 33 |
| " to Pillar " | 11 | 13 | 13 |
| Price, Iron Wts. each | 108.00 | 103.00 | 99.00 |
| " Brass " " | 119.55 | 120.65 | 113.70 |

Fig. 8388B

Double beam, upper bar $100x\frac{1}{2}$ pounds; lower bar, 200x1 pounds.

WHEN ORDERING BY FIGURE NUMBER, PLEASE GIVE THE PAGE NUMBER ALSO. FAIRBANKS RAILWAY TRACK SCALES

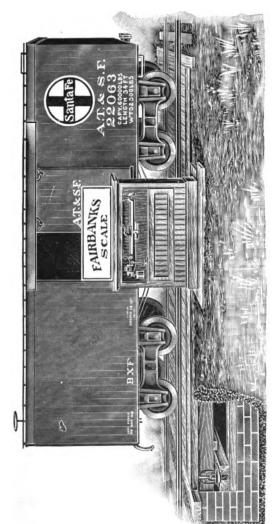


Fig. 8951A

The well known principles of the Fairbanks Pattern Track Scale have long been recognized as being the most accurate, most durable and most reliable form of construction for heavy railroad weighing.

Valuable patented improvements are constantly being added to adapt the scales to the most exacting conditions and mod-

ern methods of weighing. Scales regularly furnished with single beams, but when so ordered, will be fitted with double, triple, gridiron or type regis-

tering beams.
We should be glad to give information and quote prices upon application.

Plans will be furnished for erecting scales, either timber or steel construction, or a combination of the two, and with or without dead rail.

BOYER PNEUMATIC HAMMERS

RIVETING HAMMER



Fig. 2774A

CALKING AND CHIPPING HAMMER



BOYER LONG STROKE RIVETING HAMMERS

| Number | 40 | 50 | 60 | 80 | 90 |
|--------|-----------------------------------|--------------------------------|-------------------------|----------------------|-----------------------|
| Stroke | 4 9/16 1/1 14 100,000 | 5 34 38 19½ 100,00 | 6 78 3 3 22 | 8 1½ 3.8 24 | 9 114 3/8 25 |

One rivet set, blank or finished to suit requirements, is furnished with each of the above hammers.

Hammers with closed handles furnished when so ordered.

Best results are obtained from an air pressure of 100 pounds.

BOYER CHIPPING, CALKING AND BEADING HAMMERS

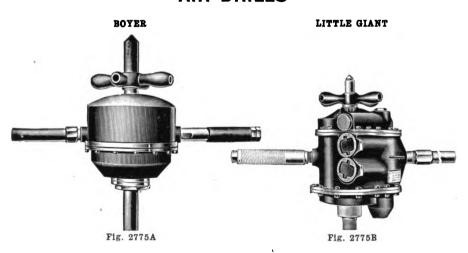
| | | • | | _ | | | | |
|------------------|---------|-------|-------|-------|-------|-------|-------|-------|
| Number | | 0 | 1 | 2 | 3 | A | В | BB |
| Stroke | | 5 | 4 | 3 | 13/1 | 3 | 2 | 11/6 |
| Hose Connections | " | 3 3 | 14 | 14 | 1/4 | 1/4 | 1/4 | 1/4 |
| Weight | .pounds | 1613 | 13 | 11 | 101 3 | 13 | 111/2 | 81/2 |
| Price | each | 80.00 | 80.00 | 80.00 | 80.00 | 80.00 | 80.00 | 73.33 |

Hammers fitted with a round bushing to take round shank tools are used generally for chipping, calking and beading flues. Hammers fitted with hexagon bushing to take hexagon shank tools are for chipping only.

- No. 0. For extra heavy chipping, calking and light riveting.
- " 1. For heavy chipping, calking and light riveting.
- 4 2. For medium calking and chipping.
- " 3. For light chipping, calking and flue beading.
- " A. For heavy chipping, calking, and light riveting.
- " B. For medium calking and chipping.
- " BB. For light chipping and calking.

501

AIR DRILLS



BOYER PISTON AIR DRILLS

| Number | 2 | 3 |
|---|--------------|--------------|
| Fitted with Square Tap Socketinches " Morse Tapernumber | 5/8 | 5/8 3 |
| Weight pounds Price each | 45 120.00 | 35 120.00 |

No. 2 is adapted for drilling up to 3 inches in diameter, and reaming and tapping up to 2 inches in diameter.

No. 3 is adapted for drilling up to 2 inches in diameter, and reaming and tapping up to $1\frac{1}{2}$ inches in diameter.

LITTLE GIANT NON-REVERSIBLE PISTON AIR DRILLS

| Number | E | D | C |
|-------------------------------|--------|--------|--------|
| Fitted with Morse Tapernumber | 4 or 5 | 4 | 3 |
| Weightpounds Priceeach | 146.67 | 120.00 | 120.00 |

LITTLE GIANT REVERSIBLE PISTON AIR DRILLS

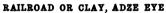
| Number | ER | DR | CR |
|-------------------------------|--------------|----------------|---|
| Fitted with Morse Tapernumber | 4 | 4 | 3 |
| Weightpounds Priceeach | 75 146,67 | $55 \\ 120.00$ | $\begin{array}{c} 32 \\ 120.00 \end{array}$ |

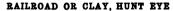
Nos. E and ER are adapted for boring cylinders and extra heavy drilling, reaming and tapping. The No. ER Machine is fitted with 34-inch square tap socket and will roll 314-inch flues.

Nos. D and DR are adapted for drilling or reaming up to 2 inches in diameter and tapping up to $1\frac{1}{4}$ inches in diameter.

Nos. C and CR are adapted for drilling up to $1\frac{1}{4}$ inches, and reaming and tapping up to 1-inch in diameter.

PICKS









Pig. 1250A

Fig. 1250B

ADZE OR HUNT EYE

| Weightpounds | 4 to 5 | 5 to 6 | 6 to 7 | 7 to 8 | 8 to 9 | 9 to 10 |
|--------------------------|--------|--------|--------|--------|--------|---------|
| Price, Adze Eyeper dozen | 13.00 | 14.00 | 15.00 | 16.00 | 18.00 | 20.00 |
| " Hunt " " | 13.00 | 14.00 | 15.00 | 16.00 | | |









ORE

| Weight | pounds | 5 to 6 6 to | 7 to 8 8 to 9 | 9 to 10 |
|--------|-------------------|-------------|---------------|---------|
| Price | pe r dozen | 14.00 15.00 | 16.00 18.00 | 20.(0 |

CONTRACTOR'S

| | | ==== | | | | | |
|----------------|-------|-------|-------|-------|-------|-------|-------|
| Weightpounds | 7 | 746 | 8 | 816 | 9 | 916 | 10 |
| , organ | | / Z | | 0/2 | _ | | |
| Priceper dozen | 18 50 | 19 00 | 19 50 | 20.50 | 91 50 | 22 50 | 23 50 |
| Theo | 10.00 | 10.00 | 10.00 | 20.00 | 21.00 | LL.00 | 20,00 |



TAMPING, HUNT EYE





ADZE OR HUNT EYE

| 337 - ! L A | 1 0 | 04-7 | 7 | 74-0 | 0 | 04-0 | |
|----------------|--------|-------|--------|-----------|-------|-------|---------|
| Weightpounds | ו סו | Oto | | 1 1 100 0 | והו | BOOS | |
| ,, e.B | | | | | | 0.00 | |
| 75. | 10 00 | 10 00 | 10 50 | 10 00 | 10 50 | 00.00 | .32 00 |
| Priceper dozen | 118 00 | 18 00 | LIS OU | 19 (N) | 19 50 | 20 00 | 121 (X) |
| 1 Hee | 120.00 | 10.00 | 120.00 | 120.00 | 10.00 | 20.00 | 21.00 |

STONE







Fig. 1250G

Fig. 1250H

STONE

| Weightpounds | 4 | 41/2 | 5 | 51/2 | 6 | 61/2 | 7 |
|----------------|-------|-------|-------|-------|-------|-------|-------|
| Priceper dozen | 15.00 | 15.50 | 16.00 | 16.50 | 17.00 | 17.50 | 18.00 |
| Weightpounds | 71/4 | 8 | 81.5 | 9 | 91/2 | 10 | |
| Priceper dozen | 18.50 | 19.00 | 19.50 | 20.00 | 20.50 | 21.00 | |

PICK EYE BLANKS

| Weight pounds | | | 41/2 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------|------|------|------|------|-------|-------|-------|-------|-------|
| Price, Driftingper dozen | 7.50 | 8.50 | 9.00 | 9.50 | 10.50 | | | | |
| " R. R " | | | 9.00 | 9.50 | 10.50 | 11.50 | 12.50 | 14.50 | 16.50 |

PICKS AND MATTOCKS

COAL PICK

DRIPTING PICK

| | | | | The second second | 1189 | _ |
|---|----------------------|---------|-------|-------------------|----------|--------|
| | Fig. 4121A | | | | ig. 4121 | |
| | COAL PICKS; REGULAR, | MEDIUM, | SLIM, | CUTTING, | AND | MINING |
| _ | | | , | | | |

| Weightpounds | 11/2, 13/4, 2 | 21/4, 21/2 | $2\frac{3}{4}$, 3 | 31/4, 31/2 | $3\frac{3}{4}$, 4 | 41/4, 41/2 |
|-----------------|---------------|------------|--------------------|------------|--------------------|------------|
| Price per dozen | 8.50 | 9.00 | 9.50 | 10.00 | 10.50 | 11.00 |
| Weightpounds | 43/4,5 | 5½ | 6 | 6½ | 7 | |
| Price per dozen | 11.50 | 12.00 | 12.50 | 13.00 | 14.00 | |

For Long Ear add 50c per dozen extra.

DRIFTING PICKS

| Weightpounds | 3 | 4 | 41/2 | 5 | 6 |
|----------------|-------|-------|-------|-------|-------|
| Priceper dozen | 12.50 | 14.00 | 15.00 | 16.00 | 17.50 |

SURFACE PICK

MILL PICK

| Fig. 4121C SURFACE F | | | | | E PICKS Fig. 4121D | | | | | | |
|----------------------|--|------------|-------|-------|--------------------|-------|-------|-------|-------|--|--|
| Weight | | pounds | 4 | 41/2 | 5 | 51/2 | 6 | 6½ | 7 | | |
| Price | | .per pound | 14.00 | 15.00 | 16.00 | 17.00 | 18.00 | 19.00 | 20.00 | | |

MILL PICKS

| Weightpounds | 1½ to 3 |
|----------------|---------|
| Priceper pound | .75 |

MATTOCK

PICK MATTOCK





| Weightpounds | 3 | 4 | 5 | 51/2 | 6 |
|------------------------------|-------|-------|---------------|---------|-------|
| Price, Short Cutterper dozen | 16.00 | 16.00 | 16.0 0 | 16.50 | |
| " Long Cutter or Pick " | | | 16.00 | • • • • | 17.00 |

GRUB HOE

BOILER PICK





Fig. 4121G GRUB HOES, BALTIMORE PATTERN Fig. 4121H

| Number | 1 | 2 | 3 |
|--|-----|-----------------|-------------------|
| Weight pounds Width inches Price per dozen | 334 | 4 4 14.00 | 4½ 4¼ 15.00 |

BOILER PICKS

| Price, weight one poundper pound | .75 |
|----------------------------------|-----|

AMES SHOVELS, SPADES, AND SCOOPS

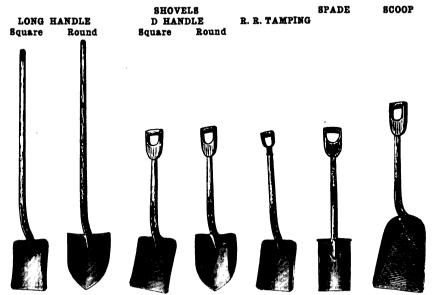


Fig. 9141A Fig. 9141B Fig. 9141C Fig. 9141D Fig. 9141E Fig. 9141F Fig. 9141G

D OR LONG HANDLE SHOVELS, CAST STEEL EDGE

| | PRICE PER DOZEN | | | | | | |
|----------|-----------------|-------------|--------------|-------------|--|--|--|
| Number | D HA | NDLE | Long Handle | | | | |
| | Square Point | Round Point | Square Point | Round Point | | | |
| 1 | 11.75 | 12.50 | 11.75 | 11.75 | | | |
| 2 | 12.00 | 12.75 | 12.00 | 12.00 | | | |
| 3 | 12.50 | 13.25 | 12.50 | 12.50 | | | |
| 4 | 13.00 | 14.00 | 13.00 | 13.00 | | | |
| 5 | 14.00 | 14.75 | 14.00 | . | | | |

PATENT SOLID CAST STEEL TAMPING SHOVELS

| Number 2 | 2 | | | per dozen | 13.50 |
|----------|---|------|------|---------------|-------|
| | | | | | |

D AND LONG HANDLE SPADES, CAST STEEL EDGE

| Number | 1 | 12.00 |
|--------|-----|-------|
| ** | 2 " | 12.25 |

D OR LONG HANDLE SCOOPS, CAST STEEL

| Number | 2 | per dozen | 13.50 |
|--------|---|-----------|-------|
| 46 | 3 | " | 13.75 |
| 44 | 4 | " | 14.25 |
| " | 5 | | 14.50 |

Special long handle and D handle cinder and charging scoops for pyrites furnaces. Prices on application.

FORKS

COTTON SEED

DIAMOND TINES, STRAP FERRULE, 30-INCH WOOD D HANDLE



Fig. 7290A

| Number | 408 | 410 | 412 | 4108 | 412S | 414S |
|---------------------------|------------|----------|------------|------------|----------|----------|
| Number of Tines | | 10 14 | 12 18 | 10 ·14 | 12 18 | 14 18 |
| Length of Tines | 16 11/4 | 161/2 | 17 11/4 | 16 11/4 | 17 | 17 |
| Clear Space between Tines | 20.00 | 24.00 | 28.00 | 24.00 | 28.00 | 33.00 |

Nos. 410S, 412S and 414S are Sawdust or Cotton Seed Forks.

COKE DIAMOND TINES, STRAP FERRULE 30-INCH WOOD D HANDLE



Fig. 7290B

| Number | | | | | | |
|---|-------|-------|-------|-------|-------|-------|
| Number of Tines Length " inches Clear Space between Tines " Price per dozen | 8 | 9 | 10 | 12 | 12 | 14 |
| Length " " inches | 151/2 | 16 | 17 | 17 | 17 | 17 |
| Clear Space between Tines | 11/4 | 11/4 | 11/4 | 11/4 | 1 | 11/4 |
| Price per dozen | 20.00 | 22.00 | 24.00 | 28.00 | 28.00 | 33.00 |

STONE OR BALLAST SQUARE TINES, STRAP FERRULE, WOOD D HANDLE



Fig. 7290C

| Number | 988 | 100S | 102S | 102SW | 1048 |
|-----------------------------|-------|-------|-------|-------|-------|
| Number of Tines | 8 | 10 | 12 | 12 | 14 |
| Length " " inches | 131/2 | 131/2 | 131/2 | 141/2 | 131/2 |
| Clear Space between Tines " | 11/4 | 11/6 | 3/4 | 7/6 | 5/8 |
| Priceper dozen | 20.00 | 25.00 | 29.00 | 29.00 | 33.00 |

Clear space measurements are made midway the length of tines.

Extras applying to all of the above except Stone Forks. Iron D handles can be furnished at same price as wood "D".

For 36-inch handles, add 1.00 per dozen list. For 4 or 4½-foot handles, deduct 1.00 per dozen list. For polished tines, add 2.00 per dozen list.

AXES

UNHANDLED





BROAD AXES AND ADZES

CANADIAN PATTERN BROAD AXE







SHIP PATTERN BROAD AXE



Fig. 1380A

Pig. 1380B

Fig. 1380C

CANADIAN PATTERN BROAD AXES

| Weight pounds { | 5 to 7 | 6 to 7, 6½ to 7½ | 7 to 8, 7½ to 8½, 7 to 9 |
|-----------------|--------------|------------------|--------------------------|
| | All 6 | All 6½ and 7 | All 7½ and 8 |
| Priceper dozen | 42.00 | 44.00 | 46.00 |
| Weightpounds { | 8 to 9 | 9 to 11 | 10 to 11 |
| | All 8½ and 9 | All 9½ and 10 | All 11 |
| Priceper dozen | 48.00 | 50.00 | 54.00 |

WESTERN PATTERN BROAD AXES

| Weight pounds { | 5 to 6½, 6 to 7½ | 7 to 8, 7½ to 8½ | 8 to 9, 8½ to 9½ |
|-----------------|------------------|------------------|------------------|
| | 6½ to 7½, 6 to 8 | 7 to 9 | 8 to 10 |
| Priceper dozen | 32.00 | 35.00 | 38.00 |

Note.—The weights and lists given for Western Pattern Broad Axes also apply to Ohio, Pennsylvania, and New Orleans patterns.

SHIP PATTERN BROAD AXES

Price, Weight 5 to 5½ pounds..... per dozen 30.00

CARPENTERS' ADZES
Half Head Full Head



Fig. 1380D



Fig. 1380E



Fig. 1380P



Fig. 1380G



COOPERS'

Fig. 1380H

ADZES

| Price, | Carpenter's Adzes, half or full head, 3 to 4½ inch cut per doze | n 24 00 |
|--------|---|---------|
| | Railroad Adzes, half or full head, 5 to 6 inch cut | 26.00 |
| u | Ship Adzes, spur head, 41/4 inch cut | 25.00 |
| ш | Ship Adzes, with lip, spur head, 5 to 51/6 inch cut | 30.00 |
| # | Coopers' Adzes, weight 3½ pounds, 3¾ inch cut " | 28.00 |

MACHINISTS' HAMMERS

BALL PEIN



STRAIGHT PEIN



CROSS PEIN



Fig. 3402C

BALL, STRAIGHT, OR CROSS PEIN

| Number | 00000 | 0000 | 000 | 00 | 0 | 1 | 2 |
|-----------------|---------|-------|--------|--------|-----------------------------------|--------|--------|
| Weight each | 4 oz. | 6 oz. | 8 oz. | 12 oz. | 1 lb. | 1¼ lb. | 1½ lb |
| Price per dozen | 12.00 | 12.00 | 12.00 | 12.00 | 12.50 | 13.50 | 14.50 |
| Number | | | | | | | |
| Weight each | 134 lb. | 2 lb. | 2¼ lb. | 2½ lb. | 2 ³ ⁄ ₄ lb. | 3 lb. | 3½ lb. |
| Price | 15.50 | 16.50 | 17.50 | 19.00 | 20.50 | 22.00 | 24.00 |

ENGINEERS'



Fig. 3402D

HELLER'S ROUNDING HAMMER



Fig. 3402E

ENGINEERS' HAMMERS

| Number | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------|-------|------------|-------|---------|-------|---------|----------|
| Weighteach Priceper dozen | | 115,10 oz. | 2 lb. | 214 lb. | 3 lb. | 316 lb. | 41/4 lb. |
| Priceper dozen | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 17.00 | 19.00 |

HELLER'S ROUNDING HAMMERS

| Price, weight 2 to 3 lbs | nor | dozen | 28 80 |
|--------------------------|-----|-------|-------|
| | | | |



HAMMERS

RI.ACKSMITHS' HAND



Pig. 5935A

RIVETING



Pig. 5935B

BLACKSMITHS' HAND

| Number | 0 | 1 | 2 | . 3 | 4 | 5 |
|----------------|-------------|-------|-------------|-------|--------|----------|
| Priceper dozen | 13.00 | 14.00 | 15.00 | | 17.00 | 19.00 |
| Weighteach | 1 lb.10 oz. | 2 lb. | 2 lb.10 oz. | 3 lb. | 3⅓ lb. | 41/2 lb. |

RIVETING

| Number | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---------------------------|-------|-------|-------|--------|--------|-------------|-------------|-------------|
| Priceper dozen Weighteach | 5.50 | 5.75 | 6.00 | 6.25 | 6.50 | 7.00 | 7.50 | 8.00 |
| | 4 oz. | 7 oz. | 9 oz. | 12 oz. | 15 oz. | 1 lb. 2 oz. | 1 lb. 6 oz. | 1 lb.10 oz. |

BOILERMAKERS'



SHIP OR BRIDGE BUILDERS' RIVETING

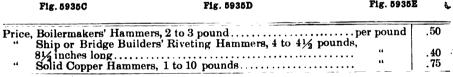


Fig. 5935D





Fig. 5935E



SLEDGES, MAULS, ETC.

CROSS PRIN

BLACKSMITHS' SLEDGES STRAIGHT PEIN

DOUBLE PACED

BLACKSMITHS' HAND HAMMER, NEW ENG-LAND PATTERN



Fig. 5678A



Fig. 5678B



Fig. 5678C **BLACKSMITHS' SLEDGES**



Fig. 5678D

| Weight | pounds | 5 and over | 3 to 5 | Under 3 |
|--------------|---|------------|------------|---------|
| Blacksmiths' | Sledges, Cross Peinper pound "Double Faced" | ,30 .30 | .40 .40 | .50 |
| | " Straight Pein " | .30 | .40 | |

BLACKSMITHS' HAND HAMMERS, No. 861

| Weightpounds | Under 3 | 3 to 5 | 5 and over |
|-----------------|---------|--------|------------|
| Price per pound | .50 | .40 | .30 |

RAILROAD TRACK CHISEL



Pig. 5678E





Fig. 5678F

| Railroad | Track | Chisels, a | about | 43/4 | pounds | per | pound | .40 |
|----------|-------|------------|-------|----------------|--------|-----|-------|-----|
| 44 | 44 | Punches | 46 | $4\frac{3}{4}$ | 44 | | ۱، | .40 |

RAILROAD TRACK MAUL



Pig. 5678G



SHIP OR TOP MAUL

Fig. 5678H

| Railroad Track Mauls, 5 to 12 poundsper pound Ship or Top Mauls, 3 to 7 pounds | .30 .42 |
|--|------------|

HANDLES Adopted Feb. 1, 1911

TURNED HICKORY AXE HANDLES-Market and N. Y. Patterns

| Lea | | | | |
|---|---|---|--|--|
| Extra or | | | No. 2 | No. : |
| Perfec- | Or | Or | or | Food |
| | | | _ | Eagl |
| | | | | 3.3 |
| | | | | |
| | | | | |
| | | | | |
| 14.00 | 11.00 | | | |
| 8.00 | 7.60 | 5.20 | 3.80 | 3.00 |
| 8.00 | 7.60 | 5.55 | 3.40 | 3.00 |
| HANDL | ES-Octa | igon and | Oval | • |
| | | XXX or | XX or | X or Sun |
| | | Beauty | Daisy | Flow |
| berman's | per doz. | 9.20 | 8.60 | 6.50 |
| man's | ** | 10.00 | 9.10 | 7.00 |
| | | 12.00 | 10.10 | 7.70 |
| | ** | 13.00 | 11.50 | 8.60 |
| | | | | 9.60 |
| | " | 9.70 | 9.40 | 7.20 |
| ANDLES | 3 | | | |
| • • • • • • • • | | per | dozen | 8.60 |
| HICKOR | Y HAN | DLES | | |
| Extra or | Excelsion | No. 1 | No. 2 | No. a |
| . Perfec- | or . | or | or | or |
| | Triumph | Hercules | | |
| | | | | Eagl |
| 10.10 8.20 | 8.60 7.00 | Hercules 6.00 | Success | Eagl |
| 10.10 | 8.60 7.00 | Hercules 6.00 | Success 4.00 | Eagl |
| 10.10 8.20 CK HA | 8.60 7.00 NDLES | 6.00 4.90 | 4.00 Mixed | 4.00 |
| 10.10 8.20 CK HA | 8.60 7.00 NDLES Excelsion | 6.00 4.90 | Success 4.00 Mixed | Eagl |
| 10.10 8.20 CK HA | 8.60 7.00 NDLES Excelsion or Triumph | No. 1 Or Hercules | 4.00 Mixed No. 2 or Success | Fagl |
| I0.10 8.20 CK HA Extra or Perfec- tion 11.50 | 8.60 7.00 NDLES Excelsion or Triumph 9.10 | Hercules | No. 2 or Success 5.10 | No. A or Eagle |
| 10.10 8.20 CK HA | 8.60 7.00 NDLES Excelsion or Triumph | No. 1 Or Hercules | 4.00 Mixed No. 2 or Success | Fagl |
| I0.10 8.20 CK HA Extra or Perfec- tion 11.50 | 8.60 7.00 NDLES Excelsion or Triumph 9.10 | Hercules | No. 2 or Success 5.10 | 1.00 A .00 No. A or Eagle 4.45 |
| 10.10 8.20 CK HA Extra or Perfection 11.50 9.00 | 8.60 7.00 NDLES Excelsior or Trlumph 9.10 6.00 5.80 | No. 1 or Hercules 7.70 5.35 3.80 | No. 2 or Success 5.10 | No. A or Eagle 4.45 |
| 10.10 8.20 CK HA Extra or Perfection 11.50 9.00 7.90 | 8.60 7.00 NDLES Excelsion or Triumph 9.10 6.00 5.80 | No. 1 or Hercules 7.70 5.35 3.80 | No. 2 or Success 5.10 | No. 4 or Eagle |
| 10.10 8.20 CK HA Extra or Perfec- tion 11.50 9.00 7.90 | 8.60 7.00 NDLES Excelsion or Triumph 9.10 6.00 5.80 | No. 1 or Hercules 7.70 5.35 3.80 | No. 2 or Success 5.10 | No. A or Eagle |
| 10.10 8.20 CK HA Extra or Perfec- tion 11.50 9.00 7.90 ND MAU | 8.60 7.00 NDLES Excelsion Triumph 9.10 6.00 5.80 JL HAN 2 34 and 3 | No.1 or Hercules 7.70 5.35 3.80 | No. 2 or Success 5.10 | No. 4 or Eagle 4.45 |
| 10.10 8.20 CK HA Extra or Perfec- tion 11.50 9.00 7.90 ND MAU 28 30 and 3 | 8.60 7.00 NDLES Excelsion or Triumph 9.10 6.00 5.80 JL HAN 2.34 and 3 6.70 | No.1 of Hercules 7.70 5.35 3.80 IDLES 6 38 7.20 | Success 4.00 Mixed | No. 4 .00 No. 4 .00 Fagle 4.45 42 8.40 6.00 |
| 10.10 8.20 CK HA Extra or Perfec- tion 11.50 9.00 7.90 ND MAU 28 30 and 3 5.60 4.00 2.70 | 8.60 7.00 NDLES Excelsior or Triumph 9.10 6.00 5.80 JL HAN 2 34 and 36 6.70 5.00 | No.1 or Hercules 7.70 5.35 3.80 ADLES 6 38 7.20 5.20 3.30 | No. 2 or Success 5.10 40 7.80 5.60 4.00 | No. 4 .00 No. 4 .00 Fagle 4.45 42 8.40 6.00 |
| 10.10 8.20 CK HA Extra or Perfec- tion 11.50 9.00 7.90 ND MAU 28 30 and 3 5.60 4.00 2.70 | 8.60 7.00 NDLES Excelsior or Triumph 9.10 6.00 5.80 JL HAN 2 34 and 3 6.70 5.00 3.00 | Hercules 6.00 4.90 No. 1 or Hercules 7.70 5.35 3.80 10 LES 6 38 7.20 3.30 -PEER | No. 2 or Success 5.10 40 7.80 5.60 4.00 | No. 4 .00 No. 4 .00 No. 4 .00 4 .45 42 8.40 6.00 4.60 |
| 10.10 8.20 CK HA Extra or Perfection 11.50 9.00 7.90 ND MAU 28 30 and 3 5.60 4.00 2.70 ET HAP 5 16 | 8.60 7.00 NDLES Excelsior Triumph 9.10 6.00 5.80 JL HAN 2 34 and 3 6.70 5.00 3.00 NDLES- 17 18 | Hercules 6.00 4.90 | No. 2 or Success 5.10 40 7.80 5.60 4.00 LESS 220 22 | Eagle 4.00 No. 4 or Eagle 4.45 42 8.40 6.00 4.60 |
| 10.10 8.20 CK HA Extra or Perfection 11.50 9.00 7.90 ND MAI 28 30 and 3 5.60 4.00 2.70 ET HAP | 8.60 7.00 NDLES Excelsior or Triumph 9.10 6.00 5.80 JL HAN 2 34 and 3 6.70 5.00 3.00 NDLES- 17 18 | No. 1 or Hercules 7.70 5.35 3.80 DLES 6 38 7.20 3.30 -PEER! 19 2.45 2.45 2. | No. 2 or Success 5.10 1.00 | No. 4 .00 No. 2 or Eagle 4.45 42 8.40 6.00 4.60 |
| | 8.00 6.50 10.00 11.00 12.00 14.00 8.00 8.00 HANDL berman's man's | 8.00 | 1 8.00 7.60 5.55 6.50 5.80 4.20 10.00 8.30 6.00 11.00 9.40 6.30 12.00 10.00 6.90 14.00 -11.00 7.50 8.00 7.60 5.20 8.00 7.60 5.55 HANDLES - Octagon and Beauty berman's per doz. man's. 12.00 man's. | S.00 |



MANHOLE AND CATCH BASIN COVERS. ETC.

MANHOLE CURR WITH SOLID COVER



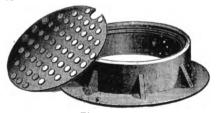




Fig. 5673A

MANHOLE CURB WITH SOLID COVER

| Diameter of Opening Inches | Height Above Flange Inches | Weight, Pounds | Price, Each |
|-------------------------------|-------------------------------|----------------|-------------|
| 22 | 8 | 475 | |

PARK GUTTER GRATE AND CURB

Price, Grate and Curbeach

COAL-HOLE COVER AND RING

COAL-HOLE COVER AND FRAME





Fig. 5673D

COAL-HOLE COVER AND RING

Price, 26-inch Ring and 20-inch Cover.....each

COAL-HOLE COVER AND FRAMES

| Size Frame Outside, Inches | Size Cover, Inches | Weight, Pounds | Price, Each |
|-------------------------------|-----------------------|----------------|-------------|
| 32x32 | 24x24 | 425 | |

CATCH BASIN RING AND COVER

CATCH BASIN COVER





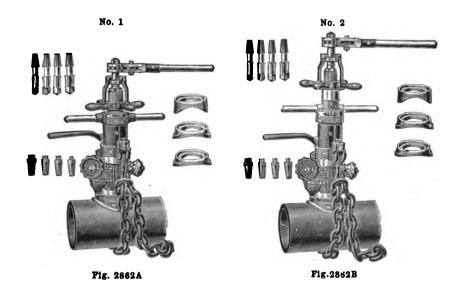
Fig. 5673E

Fig. 5673P

| Diameter Covers Inches | Ring and Cover Pounds | Covers only Pounds | Rings and Covers Each | Covers only Each |
|---------------------------|--------------------------|-----------------------|--------------------------|---------------------|
| 16 | 45 55 | 20 25 | | |
| | 16 18 | Tounus | 16 45 20 | 16 45 20 |

WATER TAPPING MACHINES

FOR TAPPING WATER MAINS AND INSERTING CORPORATION COCKS UNDER PRESSURF



| | | | | | | | | | |
|--------|-----|-----|-------------|------------|---------------|----------|------|------|--------|
| Price, | No. | . 1 | . . | . . | <i></i> . | <i>.</i> | | each | 90.00 |
| 44 | 44 | 43 | | | | | | | 100.00 |
| | | | | | | | | | |

PRICE INCLUDES

One each, Combined Drill and Tap, ½, 58, 34, and 1-inch. One each, Screw or Hexagon Plug, ½, 58, 34, and 1-inch.

Four Malleable Iron Saddles, any size.

One Chain for any size Pipe.

One small Rubber Gasket for top of Saddles.

One large Rubber Gasket for all sizes of cast or wrought iron pipe.

EXTRA COMBINED DRILLS AND TAPS FOR Nos. 1 AND 2 MACHINES

| Size | . inches | 3/8 | 1 | 1/2 | 5/8 | 3/4 | 1 |
|-------|----------|------|---|------|------|------|------|
| Price | each | 4.00 | | 4.00 | 4.50 | 5.50 | 6.50 |

EXTRA PLUGS, SADDLES, GASKETS, ETC. FOR NOS. 1 AND 2 MACHINES

| Price, Hexagon or Screw Plugs, any size | each | .80 |
|---|------|------|
| " Malleable Iron Saddles, any size | | 1.00 |
| " Small Rubber Gaskets | ** | .40 |
| " Large Rubber Gaskets | 46 | 1.50 |
| " Power Clevis | | 5.00 |

No. 2 Machine is same style and capacity as No. 1, but is heavier and affords more power for the large taps.

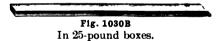
METALS

PIG LEAD



Pig. 1030A Pigs weigh about 100 lbs.

BAR LEAD



BAR TIN

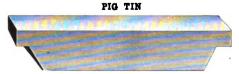


Fig. 1030C Banca and Straights; pigs weigh about 100 lbs.



Fig. 1030D In 500-pound cases.

WIPING SOLDER

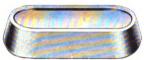


Fig. 1030E

HALF AND HALF SOLDER



Fig. 1030F Furnished in Warranted and Commercial brands.

WIRE SOLDER



Fig. 1030G Furnished in Half and Half.

SPELTER SOLDER



Fig. 1030H Fine and Coarse

SILVER SOLDER



Fig. 1030J Furnished in sheets 7/8x48 in.

COPPER INGOTS



Fig. 1030K In ingots, 15 to 20 lbs.

Aluminum Bronze

ANTIMONY



Fig. 1030L In slabs, 35 to 40 lbs.

Nickel

SPELTER OR ZINC



Fig. 1030M

Phosphor Tin

Bismuth

Price of Metals on Application



METALS, ETC.

BABBITT METAL

JENKINS ANTI-PRICTION



Fig. 8952A GENUINE





MAGNOLIA

Fig. 8952B Nos. 1 to 4

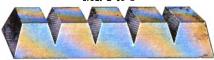


Fig. 8952C

Fig. 8952D

| Price. | Jer | kins | Ant | ti-F | rict | ion | | ٠. | | per | pound | |
|--------|-----|--------|------|------|------|-----|------|--------|------|------|------|------|------|------|------|-----|-------|--|
| " | Ma | gnolia | a | | | | | | | | | | | | | • | ••- | |
| 44 | Gei | nuine | | | | | | | | | | | | | | | •• | |
| 44 | No. | 1 | | | | | | | | | | | | | | | " | |
| ** | ** | | | | | | | | | | | | | | | | | |
| 44 | 44 | | | | | | | | | | | | | | | | | |
| | | 4 | | | | | | | | | | | | | | | | |

LADLES AND POTS

LADLE



Fig. 8952E

Fig. 8952F

| Sizeinches | 21/2 | 3 | 31/2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------|------|------|------|-------|------|-------|-------|-------|-------|-------|
| Priceper dozen | 3.75 | 4.65 | 5.50 | 6.50 | 8.75 | 10.00 | 22.00 | 28.00 | 45.00 | 54.00 |
| | | | SOLI | DER F | POTS | | | | | |

| Sizeinches | 5 | 6 | 7 | 8 | 101 2 | 131.5 |
|------------|-----|------|-----|------|-------|-------|
| Priceeach | .50 | . 65 | .80 | 1.10 | 1.75 | 3.50 |

IMPROVED JOINT RUNNERS SQUARE ASBESTOS



Fig. 8952G

| Number | 1 | 2 | 3 | 4 | 5 |
|---------------------------------------|----------------|---|-----------------------|--------------------------|---|
| Sizeinches For Pipe " Priceeach | 2, 3, 4 1.25 | $\frac{34}{4,5,6}$ 1.50 | 6, 8, 10 2.25 | 1 10, 12, 14 3, 00 | $ \begin{array}{r} 11.7 \\ 16, 18, 20 \\ 6.75 \end{array} $ |
| Number | 6 | 7 | 8 | 9 | |
| Sizeinches For Pipe " Priceeach | 24 | $ \begin{array}{r r} & 114 \\ & 36 \\ & 9.75 \end{array} $ | 11_{4} 42 11.50 | $114 \\ 48 \\ 12.50$ | |



LEAD AND TAR MELTING FURNACES



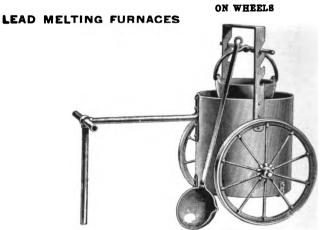


Fig. 924A

Fig. 924B

| Diameter Inches | Grate Inches | Diameter of Pot Inches | Capacity of Pot Lead Pounds | Diameter of Ladle Inches | Price Complete on Legs Each | Price Complete on Wheels Each |
|--------------------|------------------|------------------------------|--------------------------------------|--------------------------------|--------------------------------------|--|
| 18 | 1634 | 133/4 | 200 | 6 | 25.00 | 30.00 |
| 24 | $223\frac{7}{4}$ | 15 | 450 | 8 | 30.00 | 35.00 |

GASOLINE LEAD MELTING FURNACE

TAR MELTING PURNACE





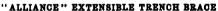


Fig. 924D

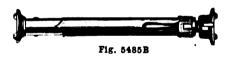
| Price, Gasoline Lead Melting Furnaceseach | 30.00 |
|---|--------|
| " Tar Melting Furnaces" | 175.00 |

TRENCH BRACES

"DUNN" TRENCH BRACE







"DUNN" TRENCH BRACES-14-inch Screw, 14-inch Barrel

| Length Closedinches | | | 21 | 24 | | 30 | 36 | 42 | 48 |
|------------------------|-------|-----------------|-------|-------|-------|-------|-------|-------|-------|
| Length of Screw inches | 11 | $\overline{12}$ | 14 | 14 | 16 | 16 | 18 | 18 | 18 |
| Priceper dozen | 23.00 | 23.00 | 24.00 | 24.00 | 26.00 | 26.00 | 27.00 | 28.00 | 29.00 |

"DUNN" TRENCH BRACES-With 2-inch Screw and 2-inch Barrel

| Length Closed | inches | 36 | 42 | 48 | 54 | 60 |
|-----------------|-------------|-------|-------|-------|-------|-------|
| Length of Screw | inches | 18 | 18 | 18 | 18 | 18 |
| Price | . per dozen | 51.00 | 52.00 | 53.00 | 54.00 | 55.00 |

"ALLIANCE" EXTENSIBLE TRENCH BRACES 14-inch Screw, 14-inch Barrel, 10-inch Extension

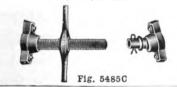
| Length Closedinches | 16 | 18 | 24 | 30 | 36 |
|---------------------|-------|-------|-------|-------|-------|
| Priceper dozen | 23.00 | 24.00 | 25.00 | 27.00 | 28.00 |

"ALLIANCE" EXTENSIBLE TRENCH BRACES With 14-inch Screw and 2-inch Barrel

| Length Closed | inches | 30 | 36 | 48 | 60 | 72 |
|---------------|----------|-------|-------|-------|-------|-------|
| Dougta Closed | ···memes | - 00 | | | - 00 | |
| Pricep | er dozen | 50.00 | 51.00 | 53.00 | 55 00 | 57 00 |
| = p | | | | , | | 000 |

BRACE FITTINGS COMPLETE

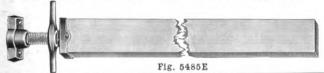






| Diameter of Screwinches | 11/2 | 11/2 | 11/2 | 11/2 | 2 |
|--|-------|-------|-------|-------|-------|
| Length of Screw inches Price, Brace Fittings per dozen | 20.00 | 21.00 | 22.00 | 23.00 | 45.00 |
| " Screw Ends | 15.00 | 16.00 | 17.00 | 18.00 | 33.00 |

COMBINED SCREW AND TIMBER BRACE

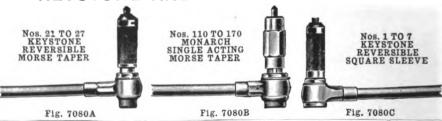


| Diameter of Screwinches | 11/2 | 11/2 | 11/2 | 2 | 2 | 2 | 2 |
|--|-------|-------|-------|-------|-------|----------------|---------------|
| Length of Screwinches | 14 | 14 | 18 | 18 | 18 | 18 | 18 |
| Size of Timber Cap " | 4 x 4 | 6 x 6 | 6 x 6 | 6 x 6 | 8 x 8 | 10×10 | 9×12 |
| Price with One Timber Cap per dozen sets | 18.00 | 20.00 | 22.00 | 38.00 | 40.00 | 42.00 | 44.00 |
| " " Two " " " " " " " " | 21.00 | 24.00 | 26.00 | 43.00 | 47.00 | 52.00 | 55.00 |

Prices do not include Timbers which are not furnished.

These Braces can be used in any width trench from 2 to 30 feet.

KEYSTONE AND MONARCH RATCHETS



| | Fig. 7080A | | | Fig. 7080B | | | Fig. 7080C | |
|-----|-----------------------|---------------|-----|-----------------------|---------------|-----|-----------------------|---------------|
| No. | With Handle Inches | Price Each | No. | With Handle Inches | Price Each | No. | With Handle Inches | Price Each |
| 21 | 10 | 5.25 | 110 | 10 | 5.25 | 1 | 10 | 5.00 |
| 22 | 14 | 6.00 | 120 | 12 | 5.75 | 2 | 14 | 5.75 |
| 23 | 16 | 6.75 | 130 | 15 | 6.25 | 3 | 16 | 6.50 |
| 24 | 18 | 7.50 | 140 | 18 | 7.75 | 4 | 18 | 7.25 |
| 25 | 22 | 7.75 | 150 | 22 | 8.75 | 5 | 22 | 7.50 |
| 26 | 24 | 8.00 | 160 | 24 | 9.25 | 6 | 24 | 7.75 |
| 27 | 28 | 8.50 | 170 | 28 | 10.25 | 7 | 28 | 8.25 |

No. 21 takes No. 2 Morse taper; Nos. 22 and 23 take No. 3 Morse taper; Nos. 24 to 27 take No. 4 Morse taper.

No. 110 takes No. 2 Morse taper; Nos. 120 and 130 take No. 3 Morse taper; Nos. 140

to 170 take No. 4 Morse taper.

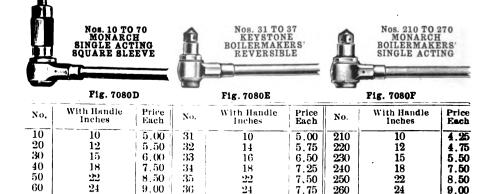
70

28

10.00

37

Nos. 1, 2 and 3 take No. 1 square shank drills; Nos. 4 to 7 take No. 2 square shank drills.



28 Nos. 10 to 30 take No. 1 square shank drills; No. 40 to 70 take No. 2 square shank drills.

Nos. 31 to 33 take No. 1 square shank drills; Nos. 34 to 37 take No. 2 square shank drills.

Nos. 210 to 230 take No. 1 square shank drills; Nos. 240 to 270 take No. 2 square shank drills.

| SGUARE SHAIN SLEEVES | > | | |
|----------------------|------|----------|------|
| | | | |
| | | | |
| Number | 1 | 2 | 4 |
| Priceeach | 1.00 | 1.25 | 1.50 |

SOLIABE CHANK

No. 1 sleeve fits Nos. 21 and 110 ratchets; No. 2 sleeve fits Nos. 22, 23, 120 and 139 ratchets; No. 4 sleeve fits Nos. 24, 25, 26, 27, 140, 150, 160 and 170 ratchets.

Note-Sleeve and boilermakers' ratchets are adapted for square shank drills only.

8.25

270

28

10.00

KEYSTONE REVERSIBLE RATCHETS. ETC.

COMBINATION No. 100

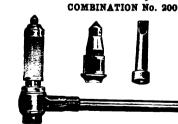


Fig. 5676A

Fig. 5676B

Combination No. 100 consists of ratchet for square shank drills, long feed socket with short feed for boilermakers' use.

Combination No. 200 consists of ratchet for taper shank twist drills, sleeve for square shank drills, and short boiler socket for square shank drills.

Sockets interchangeable.

COMBINATION No. 100

COMBINATION No. 200

| No. | With Handle Inches | Price Each | No. | With Handle Inches | Price Each | | | |
|-----|-----------------------|---------------|-----|-----------------------|---------------|--|--|--|
| 41 | 10 | 6.50 | 51 | 10 | 7.75 | | | |
| 42 | 14 | 7.50 | 52 | 14 | 9.00 | | | |
| 43 | 16 | 8.50 | 53 | 16 | 10.00 | | | |
| 44 | 18 | 9.50 | 54 | 18 | 11.25 | | | |
| 45 | 22 | 9.75 | 55 | 22 | 11.50 | | | |
| 46 | 24 | 10.00 | 56 | 24 | 11.75 | | | |
| 47 | 28 | 10.50 | 57 | 28 | 12.25 | | | |

Nos. 41 to 43 take No. 1 square shank drills. Nos. 44 to 47 take No. 2 square shank drills. No. 51 takes No. 2 Morse taper and No. 1 square shank drills. Nos. 52 and 53 take No. 3 Morse taper and No. 1 square shank drills. Nos. 54 to 57 take No. 4 Morse taper and No. 2 square shank drills.

COMBINATION No. 300

KEYSTONE RATCHET SOCKET WRENCH

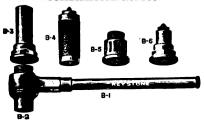




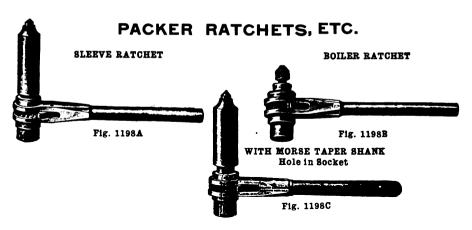
Fig. 5676C

COMBINATION No. 300

A new high-grade combination tool for light work. The taper socket is No. 1, taking all sizes of taper shank twist drills from 16 to 12 inches; also all bit stock taper drills and reamers. Tool complete includes long and short feed for Morse taper, also long and short feed for square shank drills.

| KEYSTONE RATCHET SOCKET WRENCHES | | | | | | | |
|----------------------------------|----------|-------------------|------|------|-------------|-----------|---------------------------------|
| Number | 171 | 172 | 173 | 174 | 175 | 176 | 177 |
| Length of Handleinches | | | 16 | 18 | | 24 | 28 |
| For Nuts, Bolt Sizes " | 14 to 58 | 3 € to 7 € | | | 3/4 to 11/2 | 34 to 112 | $\frac{3}{4}$ to $1\frac{1}{2}$ |
| Price with One Socketeach | | | | | 7.75 | | 8.50 |
| " Extra Sockets " | 1.75 | 2.00 | 2.50 | 3.00 | 3.00 | 3.00 | 3.00 |

Order by bolt sizes and state whether for square or hexagon nuts.



PACKER SLEEVE AND BOILER RATCHETS

| Number | 1 | 2 | 3 | 4 | 5 |
|------------------------|-------|-------|-------|-------|-------|
| Length of Handleinches | | 12 | 15 | 17 | 20 |
| Sleeve Ratchetseach | 10.50 | 13.50 | 16.00 | 19.00 | 23.00 |
| Boiler Ratchets | 9.00 | 10.50 | | | |

PACKER RATCHETS WITH MORSE TAPER SHANK HOLES IN SOCKET

| Number | | 2A | 3A | 4A |
|---|----------|-------------------|------------|---------|
| Length of Handle inches | 10 | 12 | 16 | 18 |
| Length of Handle inches For Taper Shank Drills " Price each | 16 to 13 | 5% to 33 16.00 | 1% to 11/4 | 14 to 2 |

MORSE SLEEVES FOR RATCHETS

| | , , |
|----|------------------------|
| 3A | % to 1% 4A 3.00 |
| 2 | 5% to 39 3A 2.40 |

ANGULAR AND RATCHET DRILLING MACHINE



Fig. 1198D

SQUARE SOCKETS FOR RATCHETS

| For Ratchets Number | 2A | 3A | 4A |
|---------------------|------|------|------|
| Priceeach | 1.75 | 1.75 | 2.25 |

ANGULAR AND RATCHET DRILLING MACHINES

| Number | 1 | 2 | *3 |
|------------------------------|-------|-------|-------|
| Size Hole will drill, inches | 5 8 | 1 | 11/2 |
| Weightpounds | 34 | 64 | 108 |
| Priceeach | 20.00 | 25.00 | 40.00 |

^{*}No. 3 may be speeded or back geared.

RATCHETS, RATCHET WRENCHES, ETC.

GIANT RAILROAD TRACK RATCHET
Single Acting



GIANT SOCKET WRENCH



KEYSTONE RATCHET TAP WRENCH Reversible

THE THE PARTY OF T

Pig. 5675C

GIANT RAILROAD TRACK RATCHET

Price, with 24-inch Handle only, for No. 2 Square Taper Shank Drills.....each 9.00

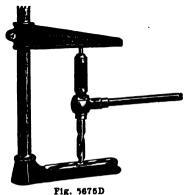
GIANT SOCKET WRENCH

| Price, for 24-inch Handle and One Socketeach | 8.00 |
|--|------|
| " Extra Sockets " | 3.50 |

Made with 24-inch Handle only and for following size nuts: 34, 78, 1, 118 and 114 Standard Bolt sizes.

KEYSTONE RATCHET TAP WRENCHES

| Number | 61 | 61A | 62 | 63 | 64 | 65 | 66 | 67 |
|----------------------------|------|------|------|------|------|------|------|------|
| Length of Handleinches | 10 | 14 | 14 | 16 | 18 | 22 | 24 | 28 |
| Square Hole in Socket " | 5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/8 | 11/8 | 11/8 |
| Price, with One Socketeach | | 5.00 | | 5.75 | | | 7.00 | 7.50 |
| " Extra Sockets " | 1.25 | 1.50 | 1.50 | 1.75 | 2.00 | 2.00 | 2.00 | 2.00 |



KEYSTONE DRILLING POST OR "OLD MAN"

For Use with Ratchet Drills

| Number | 1 | 2 |
|----------------------|------|-------|
| Height of Postinches | | 26 |
| Radius of Arm " | 10 | 12 |
| Weight pounds | 14 | 27 |
| Price each | 8.00 | 10.00 |

RATCHETS ARMSTRONG UNIVERSAL



| Number | 4 | 6 |
|---|--|----------------------------|
| Price, Complete with one spindle only each Extra Spindles " Length inches Weight pounds | 12.00 2.40 12 4 ¹ ⁄ ₄ | 18.00 3.60 18 10½ |

SPINDLES FURNISHED

| Style | Fits Ratchet Number | Taper Drills with Shank Number |
|-------|------------------------|-----------------------------------|
| M | 4 | 1 Square Taper |
| K | 4 | 2 Morse " |
| F | 6 | 2 Square " |
| N | 6 | 3 Morse " |
| S | 6 | 4 " " |

When ordering be careful to specify style of spindle wanted. Unless otherwise specified No. 4 Ratchet will be furnished with M Spindle and No. 6 Ratchet with F Spindle.

The No. 4 Ratchet is designed for ordinary work, general machine shop use. structural iron work, bridge work, etc., and is recommended and guaranteed for drilling holes up to 1 inch in diameter.

The No. 6 Ratchet is designed for very heavy work, being guaranteed to drill holes

up to 2 inches in diameter.

RENSHAW DOUBLE ACTING SQUARE AND TAPER SOCKET



| No | 1 Ratchet Drill, complete with two Collets | ach 11.0 |
|----|--|----------|
| 66 | 1 " with one Collet | " 9.4 |
| 66 | 1 Collet with square or taper hole | " 1.6 |
| 66 | 3 Ratchet Drill, complete with four Collets | " 15.0 |
| 66 | 3 " with Nos. 3 or 5 Collets only | " 11.0 |
| 66 | 3 " " 1, 2 and 3 " " | " 13.2 |
| 66 | 1 and 2 Collet, for Morse Standard Taper Shank | " 1.1 |
| 46 | 3 Collet for Morse Standard Taper Shank | " 1.7 |
| 66 | 5 " " Drills with 11/16 Square Shank | " 1.7 |

The No. 1 Ratchet takes Drills up to $\frac{1}{2}$ inch inclusive. The No. 3 Ratchet takes Drills up to $\frac{1}{2}$ inch inclusive.

.12

TRACK TOOLS. ETC.

CROWBARS, PINCH POINT



Fig. 1243B

CROWBARS, PINCH OR WEDGE POINTS Price, weight 12 to 30 pounds.....per pound

RAILROAD TAMPING BARS



Price, weight 10 to 12 pounds.....per pound .16

LINING BARS



Price, weight 18 to 25 pounds.....per pound

RAILROAD LINING BARS

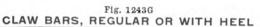
Fig. 1243E

Price, weight 20 to 24 pounds.....per pound .15

CLAW BARS

Fig. 1243F

CLAW BARS, WITH HEEL



Price, weight 28 to 30 pounds.....per pound

CLAW BARS, GOOSE NECK

Fig. 1243H

Price, weight about 25 pounds.....per pound

TRACK TOOLS, CAR PUSHERS, ETC.

CAR STARTER BARS



118. 0130E

Price, weight about 28 pounds.....per pound .22

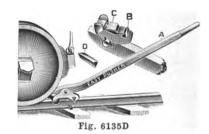
CAR PUSHERS

SHELDON

EASY







| Price, Sheldon |
|--|
| |
| " Easy " 5.00 |
| " Zelnicker " 5.00 |
| " Heel for Sheldon, made of Mushet Steel " .25 |

ENGINE AND CAR REPLACERS

Made from 12-inch Pressed Steel



Fig. 6135E

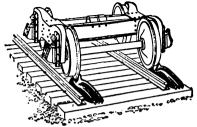


Fig. 6135F



INSIDE

Fig. 6135G

| Number | 1 | 2 | 3 |
|--------------------|-------|---|------------------|
| Height of Rail for | 6 | $\frac{4\frac{1}{2} \text{ to } 5\frac{1}{8}}{150}$ | Under 41/2 50 |
| Price | | •••• | |

TRACK TOOLS

JOHNSON CAR REPLACERS

TYPES Z. A. OR B





Fig. 5314B

This frog is in general use by standard and logging railroads, mines and contractors It straddles the rail and needs no spikes, clamps or fasteners. Rests on rail, both front and rear; adjusts itself to different heights of rail; forms a friction grip with rail during operation; brings rails to gauge during replacement; distributes load on the rail, not on one or two ties.

Special types for steel ties and street car rails.

| Type | M | C | В | A | Z | AA |
|-----------------------------|----------------|----------------|----------|-----------|-----------|-----------|
| For Rails pounds | 12 to 45 | Up to 65 | Up to 80 | Up to 100 | Up to 100 | Up to 100 |
| Height of T Rail for inches | $3\frac{1}{2}$ | 41/2 | 5 | 51/2 | 6 | 6 |
| Capacitytons | 20 | 30 | 50 | 80 | 100 | 200 |
| Throat Opening inches | 2 | $2\frac{1}{2}$ | 314 | 31/2 | 31/2 | 31/2 |
| Weightpounds | | 60 | 110 | 145 | 165 | 275 |
| Price per pair | 10.00 | 12.50 | 16.50 | 18.50 | 20.00 | 33.00 |

TIE TONGS







Fig. 5314D

| • | T | ı | E | T | O | N | G | : |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

| Number | 34A |
|----------------------|-----|
| Approx. Weightpounds | |
| Priceper pound | 20 |

SPIKE PULLERS

| Number | 56 | 56 |
|-------------------------------|----------------|--------------|
| Number of Knobs Weight pounds | $\frac{11}{2}$ | 3 2 50 |
| Price per pound | 0 | .00 |

TRACK TOOLS

HUNTINGTON TRACK GAUGE

Malleable Iron Ends, Wrought Iron Pipe Centers. Wood Center can be Substituted if Desired



| Huntington Track Gauges without Insulation | per dozen 10 00 |
|--|-----------------|
| " " with " | " 4 75.00 |

STEP LEVEL BOARD

With Adjustable Spirit Level, 14-inch Pine, with Steel Bands



Fig. 406B

Step Level Board with or without Insulation.....per dozen | 15.00



116. 200.

RAIL TONGS AND RAIL FORK

| | Weight Pounds | Price per Pound |
|------------------------------|------------------|--------------------|
| Rail Tongs | 18 | .30 |
| Rail Forks, length 33 inches | 141/9 | .25 |

RAILROAD TRACK WRENCH, SINGLE AND DOUBLE END



Fig. 406E

| Price, length 22 inches, weight | t 4 ¹ 2 pounds | per pound | .25 |
|---------------------------------|---------------------------|-----------|-----|



RAIL BENDERS

ROLLER RAIL BENDERS

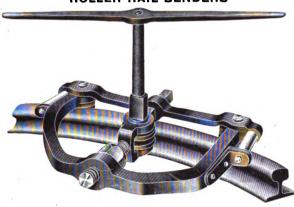


Fig. 5716A

| Number | 3 | 4 | 5 | 6 |
|--------------------------|--------|--------|--------|--------|
| For Railspounds per yard | 61-70 | 71-80 | 81-90 | 91–100 |
| Weight Complete pounds | 1 400 | 470 | 1 520 | 1 830 |
| Price "each | 140.00 | 180.00 | 230.00 | 400.00 |
| " Extra Rollersper set | 25.00 | 25.00 | 25.00 | 25.00 |

In ordering, give section and make of rail.

This Bender is not recommended for use on girder rails.

JIM CROW RAIL BENDERS





WITHOUT CROSS BAR

Fig. 5716B

WITH CROSS BAR

| 571 | |
|-----|--|

| Number | | | | |
|--|---------------|--------------|--------------|-------------|
| For Rail pounds per yard Weight pounds | 80-100 220 | 60-75 200 | 30-55 140 | 12-30 65 |
| Weight. pounds Price. each | 21.00 | 19.00 | 17.00 | 12.00 |

| 14/ | TU | ~!! | 200 | ~ - | |
|-----|----|-----|---------|-----|--|
| | | | | | |

| Number | 5 | 6 | 7 | 8 |
|--|------|------|----------|----------|
| For Rail pounds per yard Weight pounds | 25 | 50 | 25 65 | 50 95 |
| Price each | 7.00 | 9.00 | 10.00 | 13.00 |

EMERSON'S PATENT RAIL BENDING AND STRAIGHTENING MACHINES





Fig. 5755A

Fig. 5755B

| Number | 1 | 2 | 3 | 4 |
|--------------------------|--------|--------|--------|--------|
| For T Rails, up topounds | 45 | 45 65 | 65-90 | 90-115 |
| Weight with Lever " | 225 | 280 | 400 | 495 |
| Priceeach | 100.00 | 118.00 | 143.00 | 175.00 |

UNIVERSAL





Fig. 5755C

Fig. 5755D

| No. 2 Universal Weighs 380 lbs., Complete with Wooden Frame, Rollers, | |
|--|--------|
| Lever, Rod and Block: for 40 to 70 lb. T Rails 31/6 in. to 6 in. high. Price, each | 125.00 |
| No. 3 Universal Weighs 500 lbs., Complete with Wooden Frame, Rollers, | |
| Lever, Rod and Block; for 70 to 90 lb. T Rails 41/5 in. to 6 in. high. Price, " | 160.00 |
| No. 4 Universal Weighs 680 lbs., Complete with Wooden Frame, Rollers, | |
| Lever, Rod and Block; for 90 to 100 lb, T Rails 5 in, to 6 in, high. Price, " | 200.00 |
| Price, Street Rail Benders without Dies " | 175.00 |
| " Dies for Universal or Street Rail Benders* per half set | 7.50 |

^{*} Half set for one side of rail.

Universal Rail Benders are valuable for taking out surface bends, etc., in rails.

If the Universal is used for line curving, dies are necessary to fit rail.

The Street Rail Benders are especially designed for bending and straightening grooved and other rails. Jaw dies are made to fit rails of any shape. It is important that tracings of the rails be sent with orders, so that the proper shaped Steel Jaw Dies can be furnished.

These machines are made of wrought iron and steel and all parts are interchangeable.

HYDRAULIC PUNCHES AND RAIL BENDERS

HYDRAULIC PUNCHES

FOR WEB OF RAILROAD T RAIL

FOR WEB OF JOHNSON STREET RAIL





Pig. 6338A

RAILROAD T RAIL PUNCHES

| Number | 2 | 3 | 4 |
|----------------------|-----------|-----------|--------|
| Punches Hole inches | 7/8 | 7/8 80 | 7/8 |
| Weight of Railpounds | 7/8 60 | 80 | 90 |
| Number of Gland | 5 | 6 | 6 |
| Weightpounds | 200 | 375 | 400 |
| Priceeach | 150.00 | 200.00 | 225.00 |

STREET RAIL PUNCHES

| Number | 2 | 3 | . 4 |
|----------------------------|--------|-----------------------|--------------------|
| Size of Hole Punchedinches | | 1 | 11/4 |
| Thickness of Material " | 1/2 | 1/0 | 1/9 |
| Depth of Jaw " | 5 | $81\frac{7}{4}$ 550 | 81, |
| Weightpounds | 280 | 550 | $\frac{81_4}{675}$ |
| Priceeach | 225.00 | 250.00 | 325.00 |

HYDRAULIC T RAIL BENDERS



| Number | 1 | 2 | 3 |
|--------------------------------|-----------|-----------|------------|
| Weight of Rail will Bendpounds | 70 200 | 90 275 | 100 425 |
| Priceeach | 160.00 | 200.00 | 250.00 |

TRACK AND GIRDER DRILLS





Over Clutch

Fig. 6649B

BUDA NEW STYLE PAULUS AUTOMATIC FEED DRILLS

There is no difference in the drills, excepting in the hooks. The hooks are interchangeable. To designate the different types we have applied the different terms, Types A, B, C, and D. These terms are simply to enable the buyer clearly to designate the hooks he wishes. As these hooks are interchangeable, extra hooks may be purchased if desired.

Type A—This is the standard over clutch which has been largely used.

Type B—This is the special hook designed to enable operator to drill holes close to end of rail. Another advantage is that the hook may be lengthened so that fish plates may be drilled at same time as rail.

Type D—This style is for drilling girder rails. The adjustable screw supports the hook in desired position. This is also useful in drilling I-beams, the size of the hook enabling operator to drill to the center of 15-inch beams.

TYPES A. B. OR C

| Price, with Rich Spindle Chuck and Flat Bit Weight 95 Poundseach | 30 W |
|--|-------|
| Frice, with then Spindle Chuck and Flat Dit Weight so Foundseach | 30.00 |
| " Twist Bit Spindle and One Twist Bit Weight 95 Pounds " | 25.00 |
| Twist Dit Spinule and One Twist Dit Weight 30. Founds | 20.00 |
| | |

For Type D add 2.25 to above list prices.

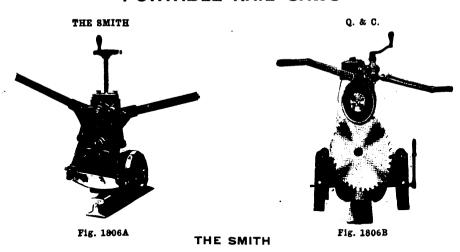
WILSON TRACK DRILLS

The mechanism of the automatic feed is a new departure. The driving gear is of the sprocket and chain type. On the crank shaft are two sprocket wheels; one, fastened rigidly to the shaft and revolving with it, drives the feed nut on the drill spindle; the other is placed loosely on the shaft and revolves with it only when engaged by the pawl on the end of the shaft. This wheel when engaged by the pawl, drives the drill spindle; thus the drill spindle and the feed nut both revolve in the same direction, but so geared that the feed nut travels a little faster than the drill spindle, and so imparts to it an even and continuous feed, either forward or back, as the crank is turned.

| Description | Over Clutch | Under Clutch |
|---|-------------|--------------|
| Weightpounds | 25 | 25 |
| Price, complete for use of Twist Drillseach | 25.00 | 25.00 |
| " with Rich Spindle and one Flat Bit " | 28.50 | 28.50 |

Quick acting for light work. Specially designed for bond wire holes for track circuit signal work.

PORTABLE RAIL SAWS



The Smith Portable Rail Saw with automatic feed will cut 100-pound rail or smaller. It will save its cost in a short time.

It is portable, weighs but 120 pounds, and can be transported easily and without

injury. It is fitted with automatic feed.

Its use overcomes the generally conceded danger of crystallization of the materia, in a steel rail, which is occasioned by the use of the chisel and sledge, and in additionly the ends are left smooth and square; and as thin a piece as one-eighth inch can be cut off, which is impossible with the old method of cutting by chisel and sledge. The latter feature is very desirable where rails buckle, or in fitting around frogs and switches.

All the danger of injury to trackmen which has been so common where rails are

lifted and dropped after nicking with chisel to break them, is avoided.

The construction is simple, all parts are strong and rigid and impossible to get out of order. It will cut a 100-pound steel rail in from 10 to 12 minutes and can be used on either loose rails or on rails fastened in position on ties.

| Price, Complete with 10 Sawseach 160.00 | | |
|---|----------------------------------|--------|
| | Price, Complete with 10 Sawseach | 160.00 |
| " Extra Saw Bladesper dozen 1.00 | " Extra Saw Bladesper dozen | 1.00 |

The saw blades are made by a special process from the celebrated carpenter steel of the finest quality and easily cuts the hardest rails.

Q & C.

Nos. 5 and 6 are designed for cutting rails at right angles to their length only.

Nos. 5A and 6A are for cutting at an angle and cut at any angle up to forty-five degrees varying by 5 degrees.

No. 5 has sufficient capacity for sawing all steam rails up to and exceeding 100 pounds per yard.

| Number | 5 | 6 | 5A | 6A |
|---|--------------------------|----------------------|--------------------------|---------------------------|
| Diameter of Saw Blade inches Thickness of " " Maximum Depth of Cut " Weight, net pounds | 16 3/6 63/4 260 | 20½ ¼ 9 320 | 16 3/6 63/4 300 | 20½ ¼ ¼ 9 400 |

Prices on application.

LEA-SIMPLEX COLD METAL SAWS

No. 15

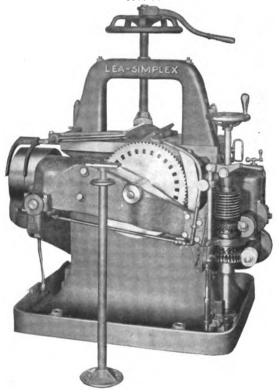


Fig. 9542A

| Number of Machine | 14 | 15 | 18 | 20 |
|--|--------------------|--------------------|----------|----------|
| Diameter, Saw Blade inches | 14 | 15 | 18 | 20 |
| Thickness " " " | $\frac{5}{32}$ | 3 32 | 316 | 136 |
| Size of Work Table " | 14x24 | $15 \times 271 \%$ | 18 x 30½ | 20x371 2 |
| Height of Work Table from Floor Line " | 30 | 30 | 30 | 30 |
| " Space under Clamp Yoke " | 10 | 11 | 121 3 | 13 |
| Width " " " " | 12^{1}_{-2} | 14 | 17 | 19 |
| Floor Space Required" " | 30x36 | 31 x 44 | 40 x 53 | 44x57 |
| Size of Tight and Loose Pulley " | 11x3 | 11 x 3 | 16 x 4 | 16x4 |
| Speed of Drive Pulley for Constant Speed r. p. m | 285 | 285 | 270 | 270 |
| Horse Power Required | $\frac{11}{5}^{2}$ | 2 | 3 | 3 |
| Capacity of Lubricating Tank gallons | 5 | 7 | 8 | 11 |
| Weightpounds | 1000 | 1265 | 2100 | 2600 |

Prices and further information on application.

The No. 15 machine will cut 5-inch round and 4½-inch square stock, 9-inch I beams on flat and will make angle cuts up to 45° on smaller stock. The No. 18 machine will cut 7 inch round and 6½-inch square stock, 12-inch I beams on flat and will make angle cuts up to 45° on smaller stock.

POWER HACK SAWS

THE STAR



Fig. 7083A

Probably there is no more popular or satis factory machine of any description made than the Star Power Saw, as per illustration. It adapts itself to all kinds of work and cuts all shapes and sizes up to $4\frac{1}{2}$ inches in diameter. It is self-feeding, requiring no attention while making a cut, and stops automatically when the work is completed. Blades used in the Star Power Saw get fair treatment and the saving made in them in this way will soon pay for a machine when there is much work to be done. It is arranged for blades either 10, 11 or 12 inches in length.

| Speedstrokes per minute | 45 |
|--|--------------|
| Speed strokes per minute Size of Pulley inches | 131/6 x 21/6 |
| Weightpounds | 168 |
| Price, with six 12-inch Bladeseach | 25.00 |

No. 4 SHOP SAW, SWIVEL VISE

| Capacity, Solidsinches | 7x8 |
|-----------------------------|-------------|
| Floor Space " | 12x32 |
| Height Over All " | 38 |
| Size of Pulley " | 14x3 |
| Height of Work Table " | 21 |
| Speed, revolutions per min. | 60 |
| Feed per minuteinches | 1 15 to 1.5 |
| Stroke of Saw Blade " | 6 |
| Length " " " | 17 |
| Thickness " " " | 1,6 |
| Net Weightpounds | 245 |
| | |
| Gross " " | 285 |
| Gross " " " Priceeach | 285 |



Pig. 70833

HACK SAW FRAMES

STARRETT PATENT





No. 145

Fig. 7301A

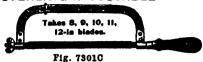
No. 141 WITH ONE BLADE

| Sizeinches | 8 | 9 | 10 | 11 | 12 |
|------------|-----|-----|-----|------|-----|
| Price each | .70 | .75 | .80 | . 85 | .90 |

No. 145 WITH ONE BLADE

1 25

STERLING ADJUSTABLE



per dozen 9.00 No. 50, Nickeled 12.00

STAR

No. 6, NOTCHED TOP



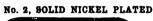


Fig. 7301E

Price, No. 6, Adjustable for 6 to 12-inch Blades..... 12.00 No. 2, Solid Frame for 8-inch Blades only.....

8.40

No. 25, SOLID NICKEL PLATED

Fig. 7301D

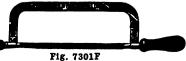
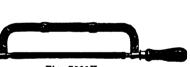


Fig. 7301G

No. 9. ADJUSTABLE

4.80 No. 25, for 8-inch Blades..... . per dozen No. 9, "8 to 12-inch Blades..... 12.00

No. 10. ADJUSTABLE



No. 15. SOLID NICKEL PLATED

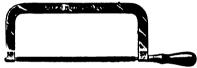


Fig. 7301H

Fig. 7301J

| No. 10, for 6 to 12-inch Bladesper dozen | 12.00 |
|--|-------|
| No. 15, " 12-inch Blades" | 15.00 |

HACK SAW BLADES



Fig. 7282A STAR. STERLING. UNIVERSAL. EUREKA AND MILFORD.

| | · · | | | | | | | |
|-------------|-----------|------|------|------|------|-------|-------|-------|
| Length | inches | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Price, Star | per gross | 3.50 | 3.75 | 4.00 | 4.50 | 5.00 | 5.50 | |
| " Sterling | | 7.00 | 7.50 | | 9.00 | 10.00 | 11.00 | 12.00 |
| " Universal | . " | 7.00 | 7.50 | | | | 11.00 | |
| " Eureka | ٠, ,, | 6.60 | 7.20 | | | | 10.20 | |
| " Milford | | 7.00 | 7.50 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 |

STARRETT FOR HAND FRAMES

| Num | ber. | | | 103 | 102 | 253 | 112 |
|-------|-------|-------|------------------|-------|-------|-------|-------|
| Num | ber o | of Te | eeth to the inch | 18 | 24 | 32 | 18 |
| Price | , 6- | inch | per gross | 7.00 | 7.00 | 7.00 | |
| +4 | 7 | 44 | - 4 | 7.50 | 7.50 | 7.50 | |
| 44 | 8 | 44 | | 8.00 | 8.00 | 8.00 | 9.00 |
| 66 | 9 | 44 | | 9.00 | 9.00 | 9.00 | 9.60 |
| 66 | 10 | 66 | | 10.00 | 10.00 | 10.00 | 10.20 |
| 66 | 11 | 44 | 46 | 11.00 | 11.00 | 11.00 | |
| 44 | 12 | " | | 12.00 | 12.00 | 12.00 | 12.60 |

Nos. 103, 102, and 253, 6, 7, 8 and 9-inch, are $\frac{7}{16}$ -inch wide and .022 inch thick and 10, 11, and 12-inch are $\frac{1}{2}$ -inch wide and .025 inch thick. No. 112 is $\frac{5}{8}$ -inch wide and .030 inch thick and also can be used in power machines.

STARRETT-POWER No. 114

| = | _ | | 1 | | | | |
|---------|-----------|----------|---------|----------|---------------|---------------|-----------|
| Langeth | | inchae | 1 1.9 | 1 121/ . | 111 | 16 | 161/ |
| Length | . | , incues | 1 14 | 1079 | 111 | 10 | 10% |
| | | | | | | | |
| Price | | | 15 00 | 10 00 | 10 00 | 411 00 | 4343 4340 |
| Price | ne | r ørnes | i ia uu | 18 (8) | 1 1 2 1 1 1 1 | 21 (8) | 122 201 |
| T 1100 | | | 120.00 | 10.00 | 10.00 | ₩1. 00 | |
| | | | | | | | |

VICTOR-HAND AND POWER

| Lengthinches | 6 7 | 8 9 | 10 11 | 12 | 14 | |
|-------------------|-------------------|------------------------|-------------------------------------|------------------|------------------|----|
| Price, Hand Frame | 7.00 7.50 | 8.00 9.00 9.00 9.60 | 10.00 11.00 10.00 11.40 10.20 | $12.60 \\ 12.60$ | $16.20 \\ 16.20$ | |
| Lengthinches | $15 16^{1}_{2}$ | 17 18 | 19 20 | 21 | 22 | 24 |
| | 1 | 22.20 24.00 | 39.60 42.00 | | | |

Q. AND C. MACHINE

| Lengthinches | 12 | 14 | 14 | 14 | 17 | 17 | 17 | 18 | 20 | 24 | 30 |
|-----------------------------|------|------|------|------|------|------|------|------|------|------|------|
| Width inches | 34 | 34 | 3.1 | 3.4 | 1 | 1 | . 1 | 1 | 1 | 1 | 1 |
| Gauge | 21 | 16 | 18 | 2Ì | 16 | 18 | 18 | 16 | 16 | 16 | 16 |
| Number of Teeth to the inch | | 10 | 15 | 15 | 10 | 10 | 12 | 10 | 10 | 10 | 10 |
| Priceper dozen | 1.25 | 2.20 | 1.80 | 1.50 | 3.25 | 3.00 | 3.00 | 3.40 | 3.76 | 4.50 | 5.50 |

These blades are made especially to be used in cutting-off machines.

PUSH AND HAND CARS

BRICK CAR

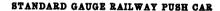






Fig. 1374A

Fig. 1374B BRICK CARS FOR 28-INCH GAUGE TRACKS

| Wheels Inches | Tread Inches | Axles Square Inches | Length Inches | Width Inches | Height to Top of Rail Inches | Sills Inches | Capacity Bricks | Weight Pounds | Price Each |
|------------------|-----------------|---------------------------|------------------|-----------------|---------------------------------------|-----------------|--------------------|------------------|---------------|
| 18 | 25/8 | 134 | 84 | 32 | $20\frac{1}{2}$ | 214 x 7 | 500 | 420 | 50.00 |

STANDARD GAUGE RAILWAY PUSH CARS Track 4 ft. 81 in.

Wheels Tread Diameter of Length Plat-Weight Price Width, Inches Pounds Inches Inches Spokes, Inches form, Inches Each 314 18 84 6716 800 60.00

No. 1 SECTION HAND CAR

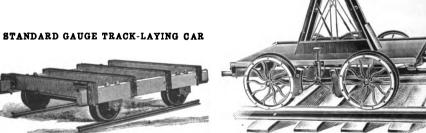


Fig. 1374C

Fig. 1374D

STANDARD GAUGE TRACK-LAYING CARS

| | | | Height Inches | Wheel Base Inches | Sills Inches | Rollers Inches | Tool Box Inches | Capacity Tons | Weight Pounds | Price Each |
|------|----|------|------------------|-------------------------|----------------------|-------------------|--------------------|------------------|------------------|---------------|
| _ 16 | 92 | 7318 | 20^{1}_{4} | 54 | $3^{1}_{2} \times 7$ | 21/2 | 641 2x20 | 6 to 8 | 1350 | 100.00 |

HAND CARS

No. 1 Section Hand Cars; wheels, 20 in., metal or wood filled; axle 11/2 in.; platform 72 x 52 in.; weight, 520 lbs.

No. 3 Bridge Gang Cars; wheels, 20 in., steel or wood filled; axle, 1¾ in., inside or outside bearings; platform, 96 x 68 in.; capacity, 12 to 15 men; weight, 735 lbs.

No. 6 Narrow-Gauge Section Hand Cars; wheels, 20 in., metal or wood filled; axle, 1¼ in.; platform, 76 x 49 in.; weight in 3-ft. gauge, 570 lbs.

Prices on application.

FAIRBANKS-MORSE CARS

GASOLINE MOTOR CAR

No. 1

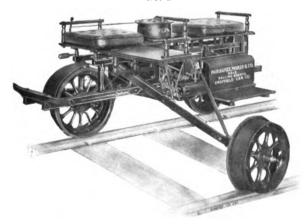


Fig. 2057A

Direct connected for two persons and the operator. Any speed desired up to 30 miles per hour. Gasoline and an electric battery supply the motive power. The battery consists of a series of eight dry cells, which with proper care will run about 900 miles. Weight 350 pounds.

INSPECTION MOTOR CAR

No. 15

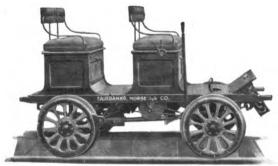


Fig. 2057B

Can be operated at any speed desired up to 30 miles per hour and 10 miles per hour on the reverse. This car can be furnished with single seat or double seat and canopy top. Weight 1200 pounds.

LUMBER TRUCKS

FOR WOOD RAILS

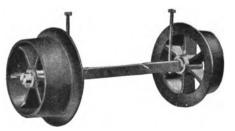


Fig. 7141A

PRICE LIST No. 50

Price per Truck of 4 Wheels and 2 Round or Square Axles, 4 Solid Cast Iron Boxings

| Diameter of Wheel Inches | Diameter of Axle Inches | Standard Face of Wheel | Weight of Each Wheel Pounds | Price, Truck 36 Inch Gauge | Extra for Each Extra Inch of | Extra for Each Extra Half Inch | Shipping Weight for 36 Inch |
|--------------------------------|--|---|-----------------------------------|---|------------------------------------|--------------------------------------|-----------------------------------|
| 14 | 13/4 | Inches 5 | 90 | 28.80 | Gauge .10 | of Face | Gauge 430 |
| 14 14 | 214 | 5 5 5 | 94 98 | $ \begin{array}{r} 31.64 \\ 35.32 \\ \hline 33.32 \\ \hline \end{array} $ | .12 | .54 .54 | 475 520 |
| 14 15 15 | $\begin{array}{c c} 2\frac{1}{2} \\ 1\frac{3}{4} \\ 2 \end{array}$ | 5 5 | 102 120 | 39.12 36.00 | .18 | .54 .60 | 560 550 |
| 15 15 15 | 214 214 212 | 5 5 | 124 128 132 | $ \begin{array}{r} 38.84 \\ 42.32 \\ 46.32 \end{array} $ | .12 .14 .18 | .60 .60 .60 | 590 640 680 |
| 16 16 | $\frac{2}{2}$ | $ \begin{array}{c} 51/2 \\ 51/2 \end{array} $ | 134 136 | 41.24 44.44 | .12 | .70 .70 | 600 650 |
| 16 18 | $\frac{\overline{2}}{2}$ | $5\frac{1}{2}$ $5\frac{1}{2}$ | 140 140 | $\frac{48.24}{42.68}$ | .18 | .70 .80 | 700 650 |
| 18 18 | $\frac{2^{1}}{2^{1}2}$ | $\frac{51_{2}}{51_{2}}$ | 144 148 | 46.36 50.16 | .14 | .86 .80 | 700 750 |
| 20 20 | $\frac{2}{2^{1}4}$ | 6 G | 156 160 | $\frac{46.52}{50.20}$ | .12 | 1.00 1.00 | 720 770 |
| 20 | $2\frac{1}{2}$ | 6 | 164 | 54.00 | .18 | 1.00 | 800 |

Wheels are made of strong gray iron and have high rolling flanges. Axles are .30 Carbon steel. The width of the face can be made anything desired.

Special steel washers are used between the wheel hubs and cotter pins. The machine work is accurate and thorough making easy running cars. Unless otherwise specified $\frac{34}{4}$ inch over the track gauge (which is the exact distance between the heads of the rails inside) and each wheel is also given $\frac{14}{4}$ inch play on its journal.

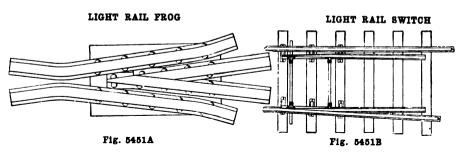
the rails inside) and each wheel is also given 14 inch play on its journal.

Square axles are drilled for bolts to hold the truck to the car bottom, except when steel axle clips are specified to be used around the axle. These bolt holes are drilled 2 inches from the inside of the collar on the axle to the center of the hole. Round axle trucks have heavy cast iron boxings to bolt to framing. No bolts or axle clips are furnished unless ordered separately.

Give track gauge, style of wheel, diameter of wheel, size of axle, kind of axle, and if square axles state whether bolts or axle clips are to be used to hold truck to the car bottom. If you wish us to furnish the bolts give the size of the timber to which the axle is to be bolted.

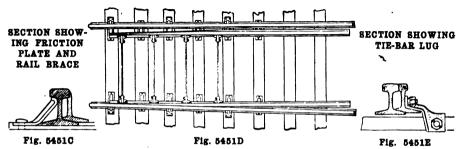
Digitized by Google

FROGS AND SWITCHES



These frogs and switches are designed for Mines, Furnaces and Industrial Works using rails from 12 to 35 pounds per yard.

15-FOOT SPLIT SWITCH



Four switch bars and 12 friction plates are furnished with each switch.

STANDARD STIFF FROGS

SECTIONAL POINT

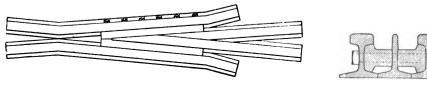


Fig. 5451P

Fig. 5451G

The Steel filling blocks are rolled accurately to fit the rail for which they are intended. The bolts are made of the best iron, furnished with hexagon nuts and fitted with steel cotters.

GROUND THROW SWITCH STAND

RAIL BRACE





Fig. 5451J

The connecting bar is forged from a solid bar without any weld. The design shown is intended for switches up to rail 35 pounds per yard.

Rail Braces are made for rail from 16 to 100 pounds.

CHILLED CAR WHEELS STANDARD SPOKE AND PLATE WHEELS

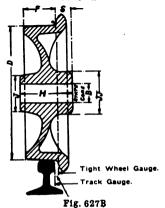


Fig. 627A

PRICE LIST No. 30

| Diam- eter | | | | | | Ps | ICE P | ER HU | NDRE | р Роп | NDS | | | | | |
|-------------------------|----------------------|------------------------------|--------------|-----|----------------------|----------------------|----------------------|--------------|--------------|--------------|----------------------|----------------------|----------------------|----------------------|----------------------|------|
| Inches | | Weight of Wheels, Pounds | | | | | | | | | | | | | | |
| | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 110 |
| 10 12 | 5.28 | 5.08 | 4.90 5.02 | | 4.64 4.76 | 4.56 4.68 | 4.48 4.60 | 4.42 4.54 | 4.36 4.48 | 4.44 | 4.38 | 4.34 | 4.28 | 4.24 | | |
| 14 16 18 | | | | | 4.92 | 4.80 | 4.70 | 4,64 | 4.56 4.60 | 4.50 4.52 | 4.48 4.50 4.54 | 4.44 4.46 4.50 | 4.38 4.42 4.46 | 4.34 4.36 4.40 | 4.30 4.32 4.36 | |
| Diam- eter Inches | | | | | | | | | | Pour | | | | | | |
| | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 220 | 240 | 260 | 280 | 300 | 320 | 340 |
| 14 16 18 20 | 4.24 4.24 4.26 | 4.22 4.18 4.20 4.24 | | | 4.08 4.10 4.14 | 4.06 4.06 4.10 | 4.04 4.04 4.08 | 4.00 4.04 | 3.96 4.00 | 3.94 3.98 | 3,90 3,94 | 3.90 | 3.86 | | ::: | |
| 22 24 | | | | | 4.18 | 4.14 | 4.10 | 4.08 | 4.04 4.00 | 4.00 3.96 | 3.98 3.94 | 3.94 3.90 | 3.90 3.88 | 3.86 3.86 | 3.84 | 3.82 |

SECTIONAL



These lists cover standard pattern wheels and are for steel rails only. The prices are on wheels in the rough, and any machine work required will be extra. special dimensions are wanted use diagram, with the following information.

State style of wheel, whether single or double plate, or spoked, and if it is used on wood or steel rails. Give the dimensions as shown on drawing. Give core of wheel and diameter of hub, or the size axle it is to be used on, and if tight or loose. Special hub will be put on without charge, but special width of face necessitating new patterns will be charged in addition.

Wheels of weights not listed take price of nearest listed wheel of the same diameter and lighter weight. Give exact face if wheels are to be machined, also if either outside or inside hub is to be faced, and the dimensions

of the key-ways if wanted.

PORTER CONTRACTORS' LOCOMOTIVES

LIGHT FOUR-WHEEL-CONNECTED SADDLE-TANK LOCOMOTIVES

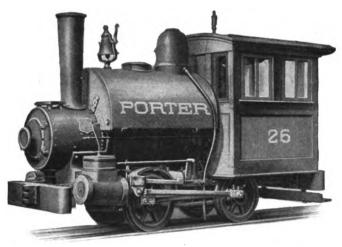


Fig. 5061A

| Cylinders, Diameterinches | 5 | 5 | 6 | 7 | 8 |
|--|------|-------|-------|-------|-------|
| " Stroke" | 8 | 10 | 10 | 12 | 14 |
| Diameter of Driving Wheels " | 20 | 20 | 20 | 24 | 26 |
| Wheel Basefeet and inches | 3-6 | 4-0 | 4-0 | 4-8 | 5–0 |
| Length Over Bumpers " | 10-6 | 11-0 | 11-6 | 12-9 | 14-0 |
| Extreme Height " | 9-4 | 9-4 | 9-6 | 9–8 | 9-10 |
| Water Capacity of Saddle-Tankgallons | 100 | 125 | 150 | 200 | 250 |
| Fuel Capacity, Coalpounds | 175 | 200 | 200 | 250 | 300 |
| " Woodcubic feet | 15 | 15 | 18 | 20 | 20 |
| Weight per Yard of Lightest Rail | | | | | |
| Advisedpounds | 12 | 14 | 16 | 16 | 20 |
| Radius of Sharpest Curve Advised. feet " " Practicable " | 25 | 30 | 30 | 35 | 35 |
| " " " Practicable" | 15 | 15 | 15 | 16 | 18 |
| Weight in Working Orderpounds | 8500 | 11000 | 1400Q | 17500 | 24000 |
| Boiler Pressure per Square Inch " | 160 | 160 | 160 | 160 | 160 |
| Tractive Force | 1360 | 1700 | 2445 | 3330 | 4680 |

HAULING CAPACITY, IN TONS OF 2000 POUNDS (EXCLUSIVE OF LOCOMOTIVE)

| On ab | solu | te lev | el | | | | | 200 | 255 | 365 | 500 | 705 |
|--------|------|--------|-------|-------|------|------|------|-----|-----|-----|-----|-----|
| On 1/2 | per | cent | grade | 26.4 | feet | per | mile | 75 | 95 | 140 | 190 | 270 |
| ()n 1 | | ** | - " | 52.8 | | - 44 | " | 45 | 55 | 85 | 115 | 160 |
| On 2 | " | 46 | " | 105.6 | " | 44 | " | 20 | 30 | 40 | 60 | 85 |
| On 3 | " | " | 46 | 158.4 | • • | 44 | " | 14 | 18 | 25 | 40 | 55 |

The above sizes are subject to modifications of details to suit gauge, fuel, size of locomotive, and requirements or preferences of customers. We are prepared to build additional sizes. A cross equalizer is used at the front driving wheels. For extra narrow gauge the wheel-base is shortened, and the frames stopped off in front of full-width straight-sides fire box. Hanging step boards may be used front and rear.

BLACKSMITHS' TOOLS

TOP FULLER



SET HAMMER

SQUARE FLATTER



Fig. 320A





Fig. 320C



Fig. 320 D

Price, all sizes......per pound

ROUND FLATTER





SQUARE PUNCH







Fig. 320H

Fig. 320E

Fig. 320F

Pig. 320G

Price, all sizes.....per pound

.42

TOP SWAGE



Fig. 320J

BOTTOM SWAGE



Fig. 320K

HOT CUTTING CHISEL



Fig. 320L

COLD CUTTING CHISEL



Pig. 320M

Price, all sizes...

BLACKSMITHS' TONGS

STRAIGHT LIP SOLID STEEL



Fig. 317A

| Lengthinches | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
|--|---|---|---|---|------------|------------|---|--|-------------|
| Weight per dozenpounds Priceper dozen | $\begin{array}{c} 27 \\ 5.20 \end{array}$ | $\begin{array}{c} 29 \\ 5.60 \end{array}$ | $\begin{array}{c} 31 \\ 6.00 \end{array}$ | $\begin{array}{c} 34 \\ 6.80 \end{array}$ | 36 7.60 | 39 8.40 | $\begin{array}{c} 42 \\ 9.20 \end{array}$ | $\begin{array}{c} 45 \\ 10.00 \end{array}$ | 49 10.80 |

CURVED LIP, FLUTED JAW, SOLID STEEL



Pig. 317B

| Lengthinches | 14 | 16 | 18 | 20 | 22 | 24 | 2 6 | 28 | 30 |
|--|------------|------------|------------|--|-------------|-------------|--|-------------|-------------|
| Weight per dozenpounds Priceper dozen | 27 7.50 | 29 8.50 | 31 9.50 | $\begin{array}{c} 34 \\ 10.50 \end{array}$ | 36 12.00 | 39 13.50 | $\begin{array}{c} 42 \\ 15.00 \end{array}$ | 45 17.00 | 49 19.00 |

SINGLE PICK-UP

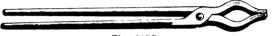


Fig. 317C

DOUBLE PICK-UP

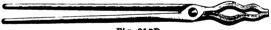


Fig. 317D

Price......per pound .40

Fig. 317E

Price.....per pound .60



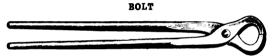


Fig. 317G

Price.....per pound .40

BLACKSMITHS' TONGS

ROUND JAW

Fig. 318A

Price.....per pound 40



Fig. 318B

BAND



Fig. 318C

Price.....per pound .60

BLACKSMITH'S CLIP



Fig. 318D

Price......per pound | 1.20

HORSESHOERS'



Fig. 318E

 Length
 inches
 10
 12
 14

 Price
 per dozen
 4.75
 5.75
 6.75

LATHE TOOL

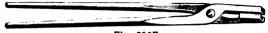


Fig. 318F

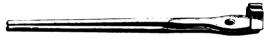


Fig. 318G

Price......per pound | .60

SWAGE BLOCKS, MANDRELS, ETC.

CAST IRON SWAGE BLOCKS

Nos. 1, 2 and 3



Nos. 114, 214 and 314



Nos. 4 and 414

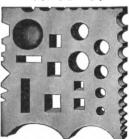


Fig. 5712A

Fig. 5712B

Fig. 5712C

| Number | 1 | 11/2 | 2 | 2½ | 3 |
|--|---------------------------|--|------------------|----------------|-------------------|
| Sizeinches Weightpounds Priceper pound | 35/8 x 10 x 14 100 | $ \begin{array}{c} 4 \times 12 \frac{1}{2} \times 12 \frac{1}{2} \\ 100 \\ \dots \end{array} $ | 3% x11x15 125 | 4x15x15 160 | 41/8×11×15 145 |
| Number | 3½ | 4 | 41/2 | 5 | |
| Sizeinches Weightpounds Priceper pound | 4½x16x16 190 | 4x15x15 165 | 4½x18x18 255 | 6x24x24 625 | |

HEADING TOOLS



Fig. 5712D

Price, All Sizes, 1/4 to 1-inch.....per pound .42



BLACKSMITHS' CONES OR MANDRELS CAST IRON

| Number | 1 | 11/2 | 2 | 3 | 4 |
|--------------------|----|------|-----|-----|-----|
| Heightinches | 32 | 40 | 48 | 52 | 54 |
| Diameter at Base " | 8 | 10 | 12 | 14 | 16 |
| " " Top " | 1 | 1 | 1 | 1 | 2 |
| Weightpounds | 55 | 90 | 115 | 140 | 200 |
| Priceper pound | | | | | l |

Digitized by Google

ANVILS



Fig. 1237A EAGLE

| Number | | 2 | 3 | 4 | 5 | 6 | Anvils weighing 70 |
|--------------|------|------|------|------|------|------|-------------------------------------|
| Priceeach | 3.50 | 4.00 | 4.30 | 4.50 | 5.00 | 5.50 | to 800 lbs., price per lb., 8 cents |
| Weightpounds | 8 | 20 | 30 | 40 | 50 | 60 | |

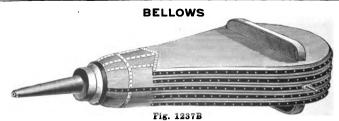
| PETER WRIGHT | |
|---------------------------|-----|
| 85 to 500 poundsper pound | .50 |
| Farrier Clip Horn | .13 |

| | | | | HAT-BODDEN | |
|-----|----|-----|--------|------------|-----------|
| 80 | to | 425 | pounds | per pou | nd Base |
| 426 | 66 | 625 | - " | - ia | ⅓c. extra |
| 626 | 66 | 800 | 66 | | 1c. " |

Farrier Clip Horn 1 cent per pound extra.

VULCAN

| Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-------------------------|---|--------------|--------------|---|--------------|--------------|--------------|------------|
| Weight pounds Priceeach | $\begin{array}{c} 15 \\ 3.25 \end{array}$ | 20 4.00 | 30 4.50 | 40 5.25 | 50 6.00 | 60 6.50 | 70 7.25 | 80 8.00 |
| Number | 9 | 10 | 11 | 12 | 13 | 14 | 15 | |
| Weightpounds Priceeach | $90 \\ 9.00$ | 100 10.00 | 110 11.00 | $\begin{array}{c} 120 \\ 12.00 \end{array}$ | 130 13.00 | 140 14.00 | 150 15.00 | •••• |



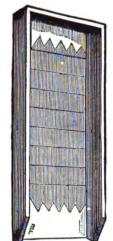
STANDARD

Size .. inches 24 26 28 30 32 34 36 38 40 42 44 Price .. each 10.00 11.00 12.00 13.00 14.00 16.00 18.00 20.00 23.00 27.00 32.00

| EXTRA LONG | | | | | | | | | | | |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Size inches | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 | 48 | 50 |
| Price each | 15.00 | 17.00 | 19.00 | 21.00 | 24.00 | 28.00 | 34.00 | 40.00 | 45.00 | 50.00 | 60.00 |

SCREENS AND SIEVES

SAND SCREEN



HEAVY STEEL COAL SCREEN



Fig. 582A

SAND SCREENS

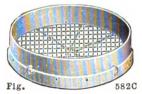
Fig. 582B

Price, Laced, 66x24 inches, 11/8-inch Frame, were 1/4-inch Apart..... per dozen

HEAVY STEEL COAL SCREENS

Price, 72x28 inches, 1½-inch Oak Frame, ½, 5% and ¾ Meshper dozen

ROUND SIEVES



ROUND COAL SIEVES

| Diameter inches | 12 | 14 | 15 | 16 | 18 | 20 |
|-----------------------------|----|----|----|----|----|----|
| Price, No. 2½ Meshper dozen | | | | | | |

ROUND SAND SIEVES

| Diameter inches | 18 | 20 |
|---|----|----|
| Price, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18 or 20 Mesh per dozen | | |

ROUND SIEVES-20 MESH

| Diameterinches | 12 | 14 | 16 |
|----------------|----|----|----|
| Price | | | |

METAL CONVEX COAL SIEVES

| Price | pe | r dozen | ٠. |
|-------|--------|---------|----|
| | | | |

STEEL SCREW PUNCH

PUNCHES

HYDRAULIC HEAD PUNCH





Fig. 1297A

STEEL SCREW PUNCHES

Fig. 1297B

| No. | Punches Hole Inches | In Iron Inches | From Edge of Sheet Inches | Weight Pounds | Price Each | Extra Punches and Dies per Pai |
|------|------------------------|-------------------|---------------------------------|------------------|---------------|--------------------------------------|
| 0 | 1/2 | 1/4 | 11/2 | 15 | 24.00 | 3.50 |
| 1 | 1/2 | 3/8 | $1\frac{1}{2}$ | 27 | 30.00 | 4.00 |
| 2 | 3/4 | 1/2 | 2 | 40 | 40.00 | 4.00 |
| 3 | 3/4 | 3/4 | 21/2 | 60 | 60.00 | 5.00 |
| 31/2 | 3/4 | 3/4 | 4 | 95 | 75.00 | 5.00 |
| 4 | 1 | 1 | 41/4 | 145 | 90.00 | 7.00 |

HYDRAULIC HEAD PUNCHES

| No. | Thickness Inch | Rivet Inch | *Gap Inches | Weight Pounds | Price Each | *Gap Inches | Weight Pounds | Price Each |
|-----|-------------------|---------------|----------------|------------------|---------------|----------------|------------------|---------------|
| 0 | 1/4 | 5/8 | 2 | 50 | 70.00 | 31/6 | 55 | 80.00 |
| 1 | 3/2 | 5/8 | 2 | 65 | 80.00 | 31% | 70 | 90.00 |
| 2 | 1/6 | 56 | 2 | 70 | 100.00 | 31/2 | 105 | 110.00 |
| 3 | 1% | 34 | 2 | 85 | 120.00 | 31/2 | 110 | 130.00 |
| 4 | 5% | 3/4 | 2 | 110 | 150.00 | 31% | 140 | 170.00 |
| 5 | 3/4 | 7/8 | 2 | 150 | 200.00 | 31/2 | 180 | 220.00 |
| 7 | 1 | 1 | 2 | 280 | 250.00 | 4 | 350 | 275.00 |

*Gap refers to distance from edge of sheet to center of hole. Greater distance to order.





Fig. 1297C

| | 115. 12310 | | |
|-----|--|----------------|---------------|
| No. | Capacity | Weight Lbs. | Price Each |
| | Will cut 1-in, iron; will punch 1-in, hole through 3/6-in, iron; depth of throat, 31 in.; length of cut, 5 in.; punches furnished, \(\frac{1}{2}, \frac{3}{16}, \frac{1}{2}, \frac{5}{16}, \frac{3}{2} \) in. | 150 | 20.00 |
| 3 | Will cut \(\frac{1}{2}\)-in, iron; will punch \(\frac{1}{2}\)-in, hole through \(\frac{1}{2}\)-in, iron; depth of throat, \(\frac{5}{2}\) in: length of cut, \(8\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | | 35.00 |

PUNCHES AND SHEARS

LIGHTNING PORTABLE HAND PUNCH





Fig. 5722A Fig. 5722B
LIGHTNING PORTABLE HAND PUNCHES

| BIGITITITE I | UNITABLE | HAITD FOI | 101123 | |
|-----------------------------|----------|-------------|--------------|------------------------------|
| Number | 1 | 3 | 5 | 7 |
| Capacity | 14 gauge | %-inch hole | 14-inch hole | 14-inch hole 14-inch iron |
| Length of Power Leverinches | 18 | 28 | 38 | 30 |
| Weight pounds | 8 | 12 | 16 | 17 |
| Priceeach | 18.00 | 20.00 | 24.00 | 26.00 |
| " Extra Punches " | 1.00 | 1.00 | 1.00 | 1.00 |
| " " Dies " | 1.20 | 1.20 | 1.20 • | 1.20 |
| " " Vises " | 2.50 | 2.50 | 2.50 | |

Especially designed for punching holes in close corners and intricate places where it is impossible to use any other style of punch.

The No. 7 Punch same as No. 5, with compound levers, but works only with the down motion.

Punches and Dies up to 1/2-inch are interchangeable in all size Tools.

LIGHTNING PORTABLE HAND SHEARS

| Capacity, Barsinches | 4 x 3/6 |
|----------------------|---------|
| Price each | 28.00 |

For cutting bands and bars, either round or flat.

WHITNEY HAND METAL PUNCHES

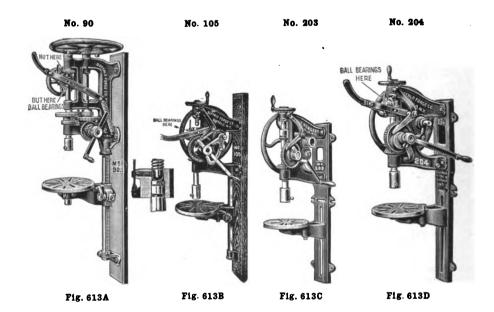


| Number | 2 |
|--------------------------|---------------|
| Capacity | 5/6-inch hole |
| Lengthinches | 23 |
| Weight pounds Price each | 20.00 |
| Extra Punches | .50 .50 |

Two Punches and one Die are included with Punch. Punches ½ to ½-inch, by 32nds, 13 sizes.

BUFFALO BLACKSMITHS' POST DRILLS

BALL BEARING



| Number | *90 | *90A | *90B | *900 | *900 | †105 | ‡201 | ‡202 | ‡203 | ‡204 |
|---------------------------------------|-------|-------|----------------|-------------------|----------|------------------------------|-------|-------|-------|----------|
| Size Hole will Drill inches | 13/4 | 13/4 | $\frac{13}{4}$ | $\frac{13/4}{22}$ | 13/4 | 11/2 | 1 | 1 | 11/2 | 1½ 23 |
| Drills to Center of Circle " | 22 | 22 | 22 | 22 | 22 | 18 | 18 | 18 | 23 | |
| Takes Straight Drill Shank. " | 41 | 64 | 41 | 41 | 41 64 | 1/2 | 1/2 | 1/2 | 1/2 | 11/4 |
| Diameter of Spindle " | 11/8 | 11/8 | 11/8 | 11/8 | 11/8 | $\frac{1}{2}$ $1\frac{1}{4}$ | 11/8 | 11/8 | 11/4 | 11/4 |
| Length Feed Run " | 6 | 6 | 6 | 6 | 6 | 4 | 31/4 | 31/4 | 4 | 4 |
| Length Drill over all " | 74 | 74 | 74 | 74 | 74 | 50 | 44 | 44 | 48 | 50 |
| Size of Pulley " | | | | | | | 51/2 | 51/2 | 8 | 8 |
| Weightpounds | 325 | 325 | 325 | 325 | 325 | 145 | 90 | 92 | 140 | 145 |
| Price. Hand Power, Lever Feed, each | 55.00 | | | | | 38.00 | 23.00 | 25.00 | 28.00 | 30.00 |
| " with Tight and Loose Pulley " and | | 60.00 | | | | 42.00 | 26.00 | 29.00 | 32.00 | 34.00 |
| " " " " and | | | | | | | | | | |
| Countershaft | | | 70.00 | | | | | | | |
| " with Cone Pulley " | | | | | | | | | | |
| " with Cone Pulley and Countershaft " | | | | | | | | | | |

*These drills equipped with planetary gears to the flywheel which give flywheel 3 times as great speed as the old style. Ball-bearings placed just beneath flywheel and at end of spindle which greatly reduces the friction. Automatic, hand and lever feed, two speeds for drilling and three for automatic feed. On special order bored for \$\frac{5}{6}\$ or \$\frac{1}{2}\$-inch. †All parts jig made and interchangable. Two speeds, slotted and adjustable table,

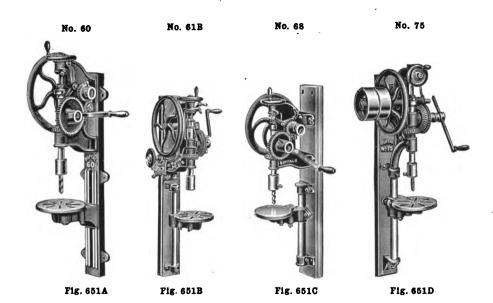
lever feed, quick return, pin clutch, adjustable automatic feed.

†These drills are provided with a rigid, ribbed iron back. On special order will be bored for 5% or \$1 inch.



BUFFALO BLACKSMITHS' POST DRILLS

BALL BEARING



| Number | 60 | 61B | 68 | 69 | 71 | 74 | 75 |
|----------------------------------|-------|----------|-------|-------------------------------------|--|-------|------------|
| Size of Hole Will Drillinches | | 1½ 16 | 1 | 7/8 | $\begin{array}{ c c c }\hline 1\frac{1}{4}\\ 12\\ \end{array}$ | 11/4 | 11.4 15 |
| Drills to Center of Circle " | 17 | | 15 | 10 | | 15 | |
| Takes Straight Shank Drills " | /2 | 1/2 | 1/2 | 3 ¹ / ₄ 35 | 1/2 | 1/2 | 1/2 |
| Length Feed Run " | 41/4 | 414 | 31/4 | 31/4 | 5 | 5 | 5 |
| Length Drills over all " | 42 | 48 | 44 | | 54 | 60 | 60 |
| Weightpounds | 135 | 125 | 100 | 54 | 130 | 200 | 210 |
| Price, Hand Power each | 32.00 | 34.00 | 22.00 | 12.50 | 36.00 | 48.00 | 52.00 |
| " With Tight and Loose Pulleys " | 36.00 | 38.00 | 26.00 | . | 40.00 | 52.00 | 56.00 |

No. 60 Iron Back. For hand power only.

" 68 Wood " " " "

Nos. 61B and 74. Hand power only with emery wheel.

- " 69 Hand power only.
- " 71 Automatic feed. Triple gear.
- " 75 Automatic feed. Triple gear, tight and loose pulleys.



BUFFALO PORTABLE FORGES

No. O. BLACKSMITHS' FORGE

No. 1. MACHINISTS' FORGE





Fig. 6927A

| Number of Forge | 0 | 1 | 2 |
|-------------------------------|----------------|---------|----------------|
| Price, without Water Tankeach | 50.00 | 40.00 | 42,00 |
| " with " "" | 54.00 | | |
| Size of Hearth inches | 28×40 | 21 x 27 | 21×27 |
| Height to Top of Bowl " | 32 | 31 | 31 |
| Diameter of Fan " | 14 | 10 | 10 |
| Weight without Tankpounds | 340 | 150 | 155 |

No. 2 Forge same as No. 1 with closed hood. No. 0 Forge is guaranteed to produce a welding heat on 3-inch iron in five minutes, and 4-inch iron in ten minutes.

No. 3. BOILER MAKERS' FORGE

No. 4. HALF OPEN HOOD

No. 5. RIVET FORGE



Fig 6927C



Fig. 6927D



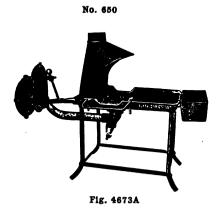
Fig. 6927E

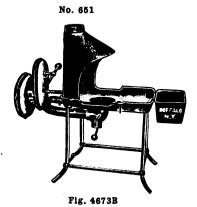
| 116. 03210 | 11B: 002:1 | | 2201 00-1- | | |
|---|-------------------------------------|------------------------------|------------------------------|------------------------------|--|
| Number of Forge | 3 | 4 | 5 | 6 | |
| Priceeach Diameter of Hearth inches Height to Top of Bowl " Diameter of Fan " Weight pounds | 36.00 21 x 27 31 10 145 | 27.00 18 33 6 75 | 24.00 18 33 6 70 | 30.00 18 33 6 80 | |

No. 6 Forge same as No. 4, with closed hood.

BUFFALO PORTABLE FORGES

WITH GEARED HAND BLOWERS





| Number | 650 | 651 |
|---------------------------|-------------|-------|
| Size of Fire Pani | | 23x30 |
| Height to Top of Fire Pan | " 32 | 30 |
| Diameter of Fan Case | " 12 | 12 |
| Weightpo | | 195 |
| Price, with Half Hood | .each 50.00 | 40.00 |
| " " " and Water Tank | | 44.00 |
| " Closed Hood | . " | 42.00 |
| " " Dash | . " | 37.00 |

Fig. 4673C

Nos. 626 AND 627, RIVET FORGES

| Number | 626 and 627 | 626A and 627A | 626B and 627B |
|----------------------------|-------------|---------------|---------------|
| Diameter of Fire Paninches | 18 | 22 | 24 |
| Height to Top Fire Pan. " | 32 | 32 | 32 |
| Diameter of Fan Case " | 12 | 12 | 12 |
| Weight, Half Hoodpounds | 120 | 130 | 140 |
| " Closed Hood " | 130 | 140 | 150 |
| Price, Half Hood each | 38.00 | 43.00 | 45.00 |
| " Closed " " | 40.00 | 45.00 | 50.00 |

No. 627 Series is fitted with Closed Hood. All Buffalo Forges can be fitted with electric motors if customer so desires at special prices.

BUFFALO PORTABLE FORGES

RIVET FORGES

No. 625 WITH GEARED HAND BLOWER



No. 625E WITH SPECIAL ELECTRIC BLOWER



Fig. 4674B

Fig. 4674A

| Number | 625 | 625A | 625B | *625E |
|--------------------------------|-------|-------|-------|-------|
| Diameter of Fire Paninches | 18 | 22 | 24 | 18 |
| Height to Top of Fire Pan " | 32 | 32 | 32 | 32 |
| Depth of Fire Pan " | 6 | 6 | 6 | 6 |
| Diameter of Fan Case " | 12 | 12 | 12 | 12 |
| Weightpounds | 110 | 120 | 130 | 130 |
| Priceeach | 35.00 | 38.00 | 41.00 | |
| " with Direct Current Motors " | | | | 40.00 |
| " " Alternating " " " | | | | 44.00 |

If desired with Ring Base, add 2.00.

COMPRESSED AIR FORGES

No. 22C



Fig. 4674C



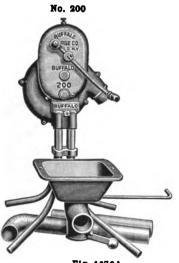
Fig. 4674D

| Number | 22C | 22AC | 22BC | 22CC | 22DC | 23C | 23AC | 23BC | 23CC | 23DC |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Diam. of Fire Pan inches | 18 | 20 | 22 | 24 | 28 | 24 | 18 | 20 | 22 | 28 |
| Height to Top of Fire Pan " | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |
| Depth of Fire Pan | 6 | 6 | 7 | 7 | 7 | 10 | 6 | 6 | 7 | 10 |
| Weight pounds | 40 | 43 | 47 | 50 | 60 | 90 | 50 | 60 | 75 | 100 |
| Priceeach | 20.00 | 22.00 | 24.00 | 26.00 | 30.00 | 28.00 | 22.00 | 24.00 | 26.00 | 32.00 |

These Forges will operate perfectly on from 5 to 10 pounds pressure of compressed air. The expense of operating for one year is 5.00.

^{*}In ordering always specify whether direct or alternating current is desired.

BUFFALO GEARED HAND BLOWERS



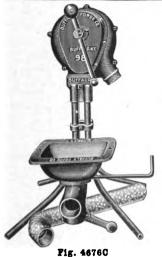


No. 201

| Fig. | 4676 | A |
|------|------|---|

Fig. 4676B

| Number | 200 | 201 |
|------------------------------|--------|-----------|
| Height to Crankinches | 41 | 41 |
| Diameter of Fan Case " | 12 | 12 |
| Size of Tuyere | 11x9x4 | 111/2x9x4 |
| Weight of Blowerpounds | 72 | 72 |
| " " Tuyere" | 36 | 36 |
| Price, with H. H. Tuyereeach | 37.00 | 37.00 |
| " without Tuyere " | 35.00 | 35.00 |
| " H. H. " only" | 5.00 | 5.00 |



No. 98 HAND BLOWER

| Number | 98 and 99 |
|---|----------------|
| Height to Crank Shaft, Adjustableinches Diameter of Fan Case | 38 to 44 12 |
| Shipping Weight, with Tuyerepounds without Tuyere | |
| Price, without Tuyereeach | 33,00 |
| " with Regular Tuyere " " Side and Center Blast | |
| Tuyere No. H. H | 35.00 |

Any of the above Blowers will be furnished with Single Column Cast Iron Stand without extra cost.

POSITIVE PRESSURE BLOWERS

HAND BLOWER





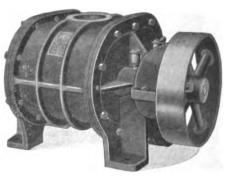


Fig. 5531A

Fig. 5531B

HAND BLOWERS

| Number | Capacity per Revolution Cubic Inches | Diameter of Outlet Inches | Diameter of Hand Wheel Inches | Size of Platform Required Inches | Shipping Weight Pounds | Price Each |
|--------|--|---------------------------------|-------------------------------------|---|------------------------------|---------------|
| 35 | 173 | $2\frac{1}{2}$ | 14 | 7½ x 10 | 100 | 24.00 |

These blowers are built for bottom discharge.

POWER BLOWERS

| Number | Capacity per Revolution Cubic Inches | Diameter of Outlet Inches | Revolutions per Minute | Size of Pulley Inches | Shipping Weight Pounds | Price with Single Pulley Each | Price with Tight and Loose Pulleys Each |
|----------------|--|---------------------------------|---------------------------------------|--|------------------------------|--|---|
| 35 40 50 | 173 288 376 | $\frac{21/2}{21/2}$ | 800 to 1200 500 # 800 300 " 600 | $\begin{array}{c} 7 \times 11_{2} \\ 8 \times 2 \\ 10 \times 21_{2} \end{array}$ | 90 135 200 | 22.50 35.00 60.00 | 24.00 37.00 62.50 |

The power required is proportional to the pressure and is based on $\frac{1}{2}$ horse power to displace 100 cubic feet of free air per minute against a pressure of 1 pound per square inch. For laundries, sand blast, forges, gas furnaces, oil furnaces, etc.

These Blowers have steel shafts and bronze bearings.

All parts are interchangeable.

Standard machines are built for Top Discharge, but can be made for Bottom Discharge, if desired.

The hand blower is built for bottom discharge.



BUFFALO STEEL PRESSURE BLOWERS



Pig. 6926A

| | | Γ | | | | | ADJUSTA | BLE BED |
|----------------------------|----------------------------------|------------------------------------|------------------------------------|--|---|--|---|--|
| Number | Height of Blower Inches | Diameter of Outlet Inches | Diameter of Pulley Inches | Face of Pulley Inches | Price without Counter- shaft Each | Price with Counter- shaft Each | Price with Bed but without Counter- shaft | Price with Bed and with Counter- shaft |
| 1 | 121/2 | 31/2 | 21/4 | $1\frac{3}{4}$ $2\frac{1}{4}$ $2\frac{5}{8}$ | 12.00 | 20.00 | | |
| . 3 | 1514 | 4 | 23/4 | 21/4 | 18.00 | 28.00 | | |
| . 3 | 191/4 | 434 | 3 | 25% | 26.00 | 38.00 | | |
| | 231/2 | 5 | 4 | 3 | 36.00 | 52.00 | | |
| 4 5 | $25\frac{37}{4}$ | 53% | 41/4 | 3 | 44.00 | 64.00 | | |
| 6 | 2934 | 61/4 | 412 | 31/8 | 55.00 | 80.00 | 90.00 | 120.00 |
| 7 | 331/4 | 714 | 5 | 3½ 4½ | 70.00 | 105.00 | 100.00 | 135.00 |
| 8 | 38 | 7¼ 8¾ | 6 | 41/2 | 90.00 | 135.00 | 130.00 | 175.00 |
| 9 | 44 | 10 | 7 | 5 | 115.00 | 175.00 | 170.00 | 230.00 |
| 10 | 56 | 121/4 | 8 | $5\frac{3}{4}$ | 160.00 | 240.00 | 265.00 | 350.00 |
| īĭ | 651/2 | 141/2 | 81/2 | 61/2 | 225.00 | 315.00 | 330.00 | 435.00 |
| 111/2 | 75 5% | 161/2 | 10 | 7 | 275.00 | 375.00 | 380.00 | 500.00 |
| $\overline{12}^{\prime z}$ | 75% | 18 | 10 | 8 | 325.00 | 435.00 | 475.00 | 625.00 |

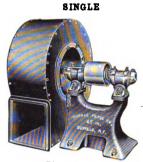
Nos. 1 to 6 Blowers, inclusive, have one pulley; Nos. 7 to 12 have two pulleys.

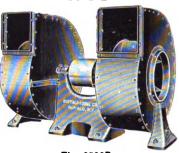
TABLE OF SPEEDS AND CAPACITIES AS APPLIED TO CUPOLAS

| Number of Blower | Diameter Inside of Cupola Inches | Pressure in Ounces | Speed No. of Revolu- tions per Minute | Melting Capacity in Pounds per Hour | Cubic Feet of Air Required per Minute | Pressure in Ounces | Speed No. of Revolu- tions per Minute | Melting Capacity in Pounds per Hour | Cubic Feet of Air Required per Minute |
|------------------------|--|--------------------------|--|--|--|--------------------------|--|--|--|
| 4 | 18 | 8 | 4732 | 1545 | 666 | 9 | 5030 | 1647 | 717 |
| 5 | 23 | 8 | 4209 | 2321 | 773 | 10 | 4726 | 2600 | 867 |
| 6 | 27 | 8 | 3660 | 3093 | 951 | 10 | 4108 | 3671 | 1067 |
| 7 | 32 | 8 | 3244 | 4218 | 1486 | 10 | 3642 | 5000 | 1668 |
| 8 | 37 | 8 | 2948 | 7500 | 2199 | 10 | 331 0 | 8800 | 2469 |
| 9 | 42 | 10 | 2785 | 10000 | 3000 | 12 | 3260 | 12000 | 3000 |
| 10 | 48 | 10 | 2195 | 14000 | 4500 | 12 | 2413 | 17000 | 5000 |
| 11 | 60 | 12 | 1952 | 22000 | 6500 | 14 | 2116 | 26000 | 8000 |
| 111/2 | 70 | 12 | 1647 | 30000 | 8500 | 14 | 1797 | 35000 | 10000 |
| 12 | 84 | 12 | 1625 | 40000 | 10000 | 14 | 1775 | 45000 | 12000 |

STEEL PLATE SINGLE AND DOUBLE PLANING MILL EXHAUSTERS







DOUBLE

Fig. 9599A

Fig. 9599B

SINGLE

| Size Inches | Diameter of of Inlet | of Inlet INCHES | | Single Far Inch | | Width of Fan | Price Each |
|----------------|----------------------|-----------------|--------|--------------------|---------------------|-----------------|---------------|
| Inches | Inches | Width | Height | Diameter | Face | Inches | LACH |
| 30 | 12 | 11 | 11 | 6 | 41.2 | 3214 | 55.00 |
| 35 | 14 | 121.5 | 121/2 | 7 | 513 | 361/4 | 70.CO |
| 40 | 16 | 14 | 14 | 8 | 61.5 | 395/8 | 90.00 |
| 45 | 18 | 16 | 16 | 9 | 7).3 | 431/3 | 115.00 |
| 50 | 20 | 18 | 18 | 10 | $8i.\overline{5}$ | 471/4 | 150.00 |
| 55 | 22 | 19_{12} | 191/3 | 11 | $91\frac{7}{2}$ | 51 | 185.00 |
| 6 0 | 24 | 21 ~ | 21 | 12 | 1013 | 54 | 200.00 |
| 70 | 28 | 25 | 25 | 14 | $11^{1}.5$ | 603/4 | 250.00 |
| 80 | 32 | 28 | 28 | · 16 | $12^{1\frac{7}{3}}$ | 6434 | 300.00 |

DOUBLE

| Size Inches | Diameter of Inlet | Size of Inc | OUTLET HES | Double F. | AN PULLEY | Width of Fan | Price | |
|----------------|-------------------|----------------|---------------|-----------|--------------------|-------------------|--------|--|
| inches | Inches | Width | Height | Diameter | Face | Inches | Each | |
| 30 | 12 | 11 | 11 | 6 | 61., | 473/8 | 90.00 | |
| 35 | 14 | 121.5 | 12^{1} $\%$ | 7 | $71\overline{5}$ | 521 | 100.00 | |
| 40 | 16 | 14 | 14 | 1 8 | $8\frac{1}{2}$ | 581/2 | 130.00 | |
| 4 5 | 18 | 16 | 16 | 10 | 9i <u>.</u> | $641\sqrt{3}$ | 170.00 | |
| 50 | 20 | 18 | 18 | 12 | 101/2 | 703/4 | 210.00 | |
| 55 | 22 | 19^{1}_{2} | 1914 | 13 | 11^{1}_{2} | 757% | 275.00 | |
| 60 | 24 | 21 | 21 | 14 | $12^{\frac{1}{2}}$ | 82 | 325.00 | |
| 70 | 28 | 25 | 25 | 16 | 14 ~ | 9215 | 400.00 | |
| 80 | 32 | 28 | 28 | 20 | 16 | $1001\frac{7}{2}$ | 500.00 | |

These exhausters have a reversible housing; adjustable to either hand and to any direction of discharge. All the adjustments are made in a few minutes and on the outside of the housing. To change the direction of discharge just loosen the eight bolts in the ring of each pedestal; then revolve the housing until the discharge points in the desired direction. To change the hand remove these bolts, loosen the set screw holding the fan to the shaft, then shift the pedestals. This operation is quickly and easily done.

LUMBERING TOOLS

PEAVEY, DUCKBILL

CANT HOOK, ROUND BILL





Fig. 1398A

PEAVIES

Fig. 1398B Malleable Split or Solid Socket Duckbill, Round or Diamond Head

| Size Handles | | | | | | | | | |
|------------------------------------|-----------------------|----------------|----------------|------------------|--|------------------|----------------|------------------|------------------|
| Price, Maple . per doz. "Hickory" | $\frac{23.50}{30.00}$ | 24.00 30.50 | 24.70 31.50 | $25.40 \\ 32.50$ | 26.10 33.50 | $25.70 \\ 31.90$ | 26.40 32.90 | $27.10 \\ 33.90$ | $27.80 \\ 34.90$ |
| Size Handles | 23/4141/2 | 2¾x5 | 234151/2 | 234x6 | 3x4½ | 3x5 | 3x514 | 3x6 | |
| Price, Maple. per doz. "Hickory" | $30.40 \\ 37.80$ | 31.10 38.80 | 31.80 39.80 | $32.50 \\ 40.80$ | $\begin{vmatrix} 34.20 \\ 42.00 \end{vmatrix}$ | 34.90 43.00 | 35.60 44.00 | 36.30 45.00 | |

Wrought Steel Socket and Clasp Duckbill, Round or Diamond Head

| Size Handles | $2\frac{1}{4}x3\frac{1}{2}$ | 214x4 | 21/4×41/2 | 21/4 x5 | 21/2x4 | 212x412 | 2½x5 | $2\frac{1}{2} \times 5\frac{1}{2}$ |
|------------------------|-----------------------------|-------------------------|-----------|---------|------------------|---------|------------------|------------------------------------|
| Price, Maple. per doz. | | 35.00 | 36.00 | 37.00 | 36.00 | 37.00 | 38.00 | 39.00 |
| " Hickory " | 39.00 | 39.90 | 40.80 | 41.70 | 41.40 | 42.30 | 43.20 | 44.10 |
| Size Handles | $234 \times 4 \frac{1}{2}$ | $2\frac{3}{4} \times 5$ | 234x51/2 | 234 x6 | $3x4\frac{1}{2}$ | 3x5 | $3x5\frac{1}{2}$ | 3x6 |
| Price, Maple. per doz. | 41.75 | 42.75 | 43.75 | 44.75 | 46.25 | 47.25 | 48.25 | 49.25 |
| " Hickory " | 48.00 | 48.90 | 49.80 | 50.70 | 53.35 | 54.35 | 55.25 | 56.15 |

Rafting, Wrought Steel Socket and Pick in One Piece, or Socket, Pick and Clasp in One Piece

| Size Handles | $2\frac{1}{4}$ x $3\frac{1}{2}$ | 214x4 | 214x41/2 | 21/4x5 | 21/2x4 | 21/2 x 41/2 | $2\frac{1}{2}x5$ | $2\frac{1}{2}$ x5\frac{1}{2} |
|--|---------------------------------|---------------------------------|---|--------------------------------|---------------------------|---------------------|---------------------------------|------------------------------|
| Price, Maple. per doz. | | 35.00 | 36.00 | 37.00 | 36.00 | 37.00 | 38.00 | 39.00 |
| " Hickory " | 39.00 | 39.90 | 40.80 | 41.70 | 41.40 | 42.30 | 43.20 | 44.10 |
| | | | | | | | | |
| Size Handles | 234x416 | 2³₄′x5 | $2\frac{3}{4}x5\frac{1}{2}$ | 23/4×6 | 3x41/2 | 3x5 | $3x5\frac{1}{2}$ | 3x6 |
| Size Handles Price, Maple. per doz. | | $\frac{2^{3}4 \times 5}{42.75}$ | $\frac{2\frac{3}{4}x5\frac{1}{2}}{43.75}$ | $\frac{2\frac{3}{4}x6}{44.75}$ | $\frac{3x41/_{2}}{46.25}$ | $\frac{3x5}{47.25}$ | $-\frac{3x5\frac{1}{2}}{48.25}$ | $\frac{3x6}{49.25}$ |

CANT HOOKS

Malleable Clasp or Malleable "Clip" Duckbill, Round or Diamond Head, Short or Extension Toe Ring

| Size Handles | | | | | | | 234x5 |
|---------------------------------|---------------------------------|-------|----------------|----------------|----------------|----------------|----------------|
| Price, Mapleper doz. "Hickory" | | | 19.40 24.80 | | | | 23.15 29.30 |
| Size Handles | $2\frac{3}{4}$ x $5\frac{1}{2}$ | 234x6 | 3x4½ | 3x5 | 3x5½ | 3x6 | |
| Price, Mapleper doz. "Hickory" | 23.80 30.00 | | 28.20 35.40 | 28.85 36.20 | 29.50 37.00 | 30.15 37.80 | |

Malleable Clasp, Chisel Point, Short Toe Ring

| Size Handles | 21/2x 41/2 | 2½x5 | 2½x 5½ | $2\frac{3}{4}$ x $4\frac{1}{2}$ | 234x5 | $2\frac{3}{4}$ x $5\frac{1}{2}$ | 23x6 | 3 x 4⅓ | 3 x 5 | 3x5½ | 3 x 6 |
|-------------------------|------------|-------|--------|---------------------------------|-------|---------------------------------|-------|--------------------|--------------|-------|--------------|
| Price, Maple . per doz. | 18.50 | 19.10 | 19.70 | 21.75 | 22.35 | 23.00 | 23.60 | $\overline{27.50}$ | 28.10 | 28.70 | 29.40 |
| " Hickory " | 23.90 | 24.60 | 25.30 | 27.80 | 28.50 | 2 9.2 0 | 29,90 | 34.70 | 35.40 | 36.10 | 36.80 |

Wrought Steel Clasp, Duckbill, Round or Diamond Head, Short or Extension Toe Ring

| Size Handles | 2^{1} $2 \times 4 \frac{1}{2}$ | $2\frac{1}{2}$ x5 | $2\frac{1}{2}$ x5 $\frac{1}{2}$ | 2¾x41/2 | 234x5 | $2\frac{3}{4}$ x $5\frac{1}{2}$ | 24x6 | $3x4\frac{1}{2}$ | 3x5 | $3x5\frac{1}{2}$ | 3x6 |
|------------------------|----------------------------------|-------------------|---------------------------------|---------|-------|---------------------------------|-------|------------------|-------|------------------|-------|
| Price, Maple, per doz. | 21.25 | 21.90 | 22.55 | 24.40 | 25.00 | 25.65 | 26.30 | 30.00 | 30.65 | 31.30 | 31.95 |
| " Hickory . " | 27.10 | 27.80 | 28.50 | 30.55 | 31.25 | 31.95 | 32.65 | 37.50 | 38.20 | 38.90 | 39.60 |



PICKAROON, WITH HOOK AND PIKE

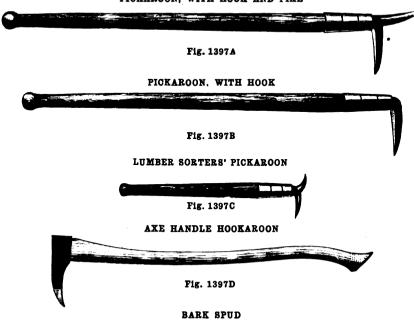


Fig. 1397E

PICKAROONS

| Price, | No. | 358 | with | Hook | and | Pike, | 2 | Foot | Handle | epe | r dozen | 16.16 |
|--------|-----|-----|------|------|-------|-------|----------|------|--------|---------------------------------------|---------|-------|
| 66 | 46 | 419 | 44 | 44 | " | . " | 3 | 44 | 44 | · · · · · · · · · · · · · · · · · · · | " | 16.66 |
| ** | " | 357 | " | " | on | ly | 2 | " | " | | " | 15.50 |
| 44 | " | 418 | 46 | " | • • • | | 3 | 44 | 44 | | " | 16.00 |
| | | | | | | | | | | | | |

LUMBER SORTERS' PICKAROONS

AXE HANDLE HOOKAROONS With Steel Point Pick

| | _ | | | | | | |
|--------|-----|-----|------|-------|------|-----------|-------|
| Price, | No. | 421 | with | Light | Pike | per dozen | 13.00 |
| | | | | Heavy | 44 | | 16.45 |

BARK SPUDS

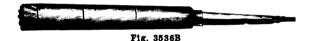
| The second of th | -, |
|--|---------|
| Price, No. 638 with Hard Maple Handles, 12 to 15 inches long per doze | 1 20.80 |
| " " 639 without Handles " | 19.40 |

TIMBER GRAPPLE OR LUG HOOKS



No. 425, 4-ft. Maple Handle, Duck Bill.....per dozen 26.71

PIKE POLES WITH PIKE ONLY With Second Growth Onio White Ash Handles



No. 414, 14-ft. Handle..... per dozen 25.50

PIKE POLES WITH STRAIGHT PIKE AND HOOK



No. 408, 14-ft. Handle.....per dozen | 28.50

CANT HOOK AND PEAVY HANDLES Select Hickory

Fig. 3536D

| Number | 752 | 756 | 757 | 760 |
|----------------|------|----------------|------------|------|
| Size per dozen | 2½x5 | 234 x 5 | 23/4 x51/4 | 3x5⅓ |
| | 5.90 | 6.90 | 7.30 | 8.30 |

SKIDDING TONGS WITH RINGS ONLY





Fig. 5621A

Fig. 5621B

Fig. 5621C

| Number | 510 | *513 | *524 | *525 | *359 |
|-------------------------------------|-------|----------------|----------|-------|-------|
| Size Octagon Steel inches To Open " | 36 | | 1¾ 36 | | 60 |
| Price per dozen per pair | 90.80 | 13. 1 5 | 20.00 | 21.25 | 38.00 |

^{*}These sizes made to order only.

SWAMP HOOKS

| Number | | | 550 | 551 | 552 | 553 | 556 |
|----------------------------|-------------|-----------|-------|-------|-------|-------|-------|
| Size of Octagon "Square | | inches | 1 | 11/8 | 11/4 | | |
| | | per dozen | | | | | |
| Price | | per dozen | 30.00 | 32.50 | 37.50 | 30.00 | 30.00 |

GRAPPLE HOOKS

| Number | | | | | |
|--|-------|-------|-------|-------|-------|
| Size of Octagon Steel inches Price per dozen | 3/4 | 7/8 | 1 | 11/8 | 114 |
| Priceper dozen | 38.00 | 40.65 | 43.40 | 48.70 | 56.60 |

THE GOODYEAR PATENT LOAD BINDERS FOR LOGS AND LUMBER





Fig. 5621D

| | | per pair † 4.00 |
|-------|--|-----------------|
| | | |
| Price | | |
| | | |
| | | |



RAFTING DOGS, ETC.



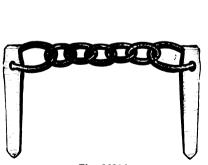






Fig. 1633A

Fig. 1633B

Fig. 1633C

CHAIN RAFTING DOGS

| Size of Dogsinches | 11/8 x 3/8 |
|--------------------------|------------|
| Size of Chain inches | ¾6 |
| Number of Links in Chain | 25.00 |

RING DOGS

| Size of Round Ironinches | 34 | 7.8 | 1 |
|--------------------------|-------|-------|-------|
| Size of Ringinches | 2 | 21/2 | 3 |
| Priceper hundred | 18.00 | 21.00 | 24.00 |

EYE DOGS

| Size of Round Ironinches | 1/2 | 5/8 |
|--------------------------|-------|-------|
| Size of Eyeinches | 114 | 11/2 |
| Length" | 6 | 6 |
| Priceper hundred | 14.00 | 18.00 |

ROUND CHAIN HOOK

GRAB CHAIN HOOK

SAW WEDGE







Fig. 16331



Fig. 1633F

ROUND AND GRAB CHAIN HOOKS

| Sizeinches | _14_ | 5 / 216 | 3 8 | .7 ₁₆ | 1/2 | _ 28 _ | 34 |
|----------------------------------|-------|--------------|-------|---------------------------|---------------|--------------|-------------|
| For Chaininches Priceper hundred | 10 00 | 516 13 00 | 18 30 | 7 ₁₆ 22, 50 | $\frac{1}{2}$ | 5 s 50 00 | 34 66 50 |

SAW WEDGES

| | | |
|--------------------------------|---------------|-----|
| Price, assorted 1½ to 3 pounds | per pound | .14 |

CONNECTING LINKS. REPAIR LINKS. ETC.

KEYSTONE CONNECTING LINKS OPEN

2.00 2.25

2.25 2.75







Fig. 6846B

Fig. 6846A

Sizeinches

Price, Forge Finish..per doz.

Galvanized

| | | | | -0 | | | |
|------|------|------|-------|-------|-------|-------|-------|
| 7/16 | 1/2 | 5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/4 |
| | | | 10.00 | | | | |
| 4.00 | 5.00 | 9.00 | 12.00 | 15.00 | 18.00 | 21.00 | 24.00 |

LAP LINKS, OPEN END

COLD SHUTS





Fig. 6846C Fig. 6846D WROUGHT IRON LAP LINKS, OPEN END

2.50 3.25

3.25

| Number | . 0 | 1 | 2 | 3 | 4 |
|---|--------------------------|---------------------|---|---|-------------------------------|
| Outside Measurementsinches Size of Iron | 13/8×13/4 1/4 8.50 | 1½x1½ 1¼ 9.00 | 1 ³ / ₄ x2 ³ / ₈ 12.00 | 2x2 ⁷ / ₈ 3/ ₈ 16.00 | 23 8 x 3 1 4 1/2 32 .00 |

WROUGHT IRON COLD SHUTS

| Number | 10 | 11 | 12 | 13 | 14 |
|---|--------|---|------------------|-----|-----------------------|
| Outside Measurementsinches Size of Iron | 1½x2½6 | $\begin{array}{c c} 1\frac{1}{4}x2\frac{3}{8} \\ 22 & 50 \end{array}$ | 176x234 23.75 | 7/6 | 2x3%6 1/2 41.25 |

WROUGHT IRON PIN ANCHOR SHACKLES



Fig. 6846E

| Sizeinches | 1/4 | 5/16 | 3/8 | 7/6 | 1/2 | 9/16 |
|-------------------------------------|----------------|---------------------|--------------|----------------|--------------|---------------------|
| Price, Galvanized | $2.75 \\ 2.50$ | $\frac{2.75}{2.50}$ | | 3.65 3.40 | 4.25 3.75 | $\frac{4.75}{4.25}$ |
| Sizeinches | 5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/4 |
| Price, Galvanized per dozen "Black" | 5.50 4.75 | | 8.70 7.25 | 14.00 11.00 | | |

WEDGES

WOOD CHOPPERS' WEDGES

TRUCKEE PATTERN, No. 980







Fig. 1652A

Fig. 1652B

OIL FINISH



Fig 1652C

WOOD CHOPPERS' WEDGES, No. 980

| Weightpounds | 3 to 10 |
|----------------|---------|
| Priceper pound | .25 |

WOOD CHOPPERS' WEDGES, AXE FINISH AND OIL FINISH

| Weightpounds | 3 to 5 |
|----------------|--------|
| Priceper pound | .25 |

STAVE WEDGES

No. 1020B

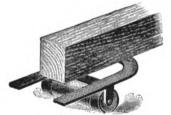


Fig. 1652D

| Weightpounds | 3½ to 5 |
|----------------|---------|
| Priceper pound | .25 |



HORSE SHOE DOLLIES



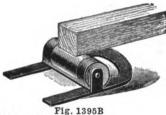


Fig. 1395A

HORSE SHOE DOLLIES With Wrought Steel Frame

 Price, with 4 x 14-inch Rock Maple Roller
 each
 5.00

 " 6 x 14 " Cast Iron Roller
 " 6.75

TIMBER TRUCK OR DOLLY

CONCAVE ROLLER

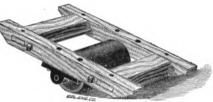




Fig. 1395C

TIMBER TRUCKS
With 3½ x 3½ x 19 x 20-Inch Oak or Ash Frame

| Price, | with | 41/2 | x 19- | inch | Rock | Mar | le Rol | ler | ••• | | | | | .each | 8.40 |
|--------|------|------|-------------|------|------|------|--------|-----|---------|------|------|------|------|-----------|-------|
| " | " | 6 | x 19 | " | Cast | Iron | Roller | · | | | | | | . " | 9,50 |
| | | | x 19 | | | | | | | | | | | " | 12.50 |

CONCAVE ROLLERS-For Iron or Pipe

Price.....each 12.00

CAR DOOR ROLLERS

END DOOR ROLLER

SIDE DOOR ROLLER





Fig. 1395E

END DOOR ROLLERS

Price......each 5.00

SIDE DOOR ROLLERS

Priceeach. 9.00

Length of wood, 4½ ft.; screw, 16 ins.; entire length, 5 ft. 10 ins; width of Roller, about 15 ins.

HICKORY BOARD AND LOG RULES

BOARD RULES

No. 1 INSPECTORS'

DIAMOND HEAD





Fig. 5934A

Fig. 5934B

| Number. 1 | 2 9 | 2N 2½ | 3 | 4 | 5 | 6 | 6N | 7 | 8 | 10 | 12 | 13 | 131/2 |
|----------------------|---------|------------|------------------|----------|--------|-----------|-------|-------|-------|-------|-------------|-------|-------------|
| Tier 3 | 3 | 3 3 | 3 | 3 | 3 | 3 | - 3 | 4 | 4 | 5 | 4 | 4 | 4 |
| Length feet 31/2 | 3 | 3 21/2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 31/2 |
| Width, inches 11 8 | 118 | 1 11 % | $1^{1}\acute{s}$ | $1^{1}i$ | 11_8 | 1^{1} s | 1 | 114 | 114 | 11/2 | 1^{1}_{4} | 114 | 1^{1}_{4} |
| Price per doz. 27.00 | 25.00 2 | 5.00 24.00 | 23,00 | 21.00 | 25.00 | 27.00 | 27.00 | 23.00 | 25.00 | 30.00 | 28.00 | 28.00 | 30.00 |

Rules Numbers 1, 2, 2N, 21/2, 3, 8, 10, 13, and 131/2 have brazed heads.

Rules Numbers 6, 6N, and 12 have brazed heads and brass plates.

Rules Numbers 4, 5, and 7 have patent socket steel heads.

Diamond head rules apply on foregoing list of rules with brazed heads.

Made to measure boards 8 to 18 feet.

Nos. 13 and 131/2 have Doyle log scale on one side.

LOG RULES

No. 14 SQUARE HEAD

No. 16 SOLID HOOK







| Number | | | | | | | | | | |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Length with Handleinches | 56 | 42 | 56 | 56 | 56 | 56 | 56 | 56 | 56 | 56 |
| Price per dozen | 27.00 | 23.00 | 27.00 | 28.00 | 28.00 | 29.00 | 25.00 | 21.00 | 29.00 | 27.00 |

For measuring logs 8 to 20 feet.

In ordering always state scale desired.

LUMBER GAUGES



Fig. 5934E

| Numbers | Thickness of Lumber Measured Inches | Price per Dozen |
|---------|--|--------------------|
| 0 00 | $\begin{array}{c} 1, 1 \\ 1, 1 \\ 4, 1 \\ 2, 1 \\ 3, 1 \\ 2, 1 \\ 3, 1 \\ 2, 1 \\ 3, 1 \\ 4, 1 \\ 2, 1 \\ 3, 1 \\ 4, 2 \\ 2 \end{array}$ | 6.00 6.00 |
| 000 | $\frac{5}{8}, \frac{3}{4}, \frac{1}{1}, \frac{11}{4}, \frac{2}{2}, \frac{21}{2}$ | 6.50 |



CRAYONS

LUMBER WATER PROOF



Fig. 7764A

| Number | 361 | 362 | 365 | 3651/2 |
|--|--------------------------------|--------------------|--------------------|-----------|
| Grade Diameter inches Length " Price per gross | Regular 1/2 41/2 6 00 | Hard 1/2 41/2 6.00 | Soft 1/2 41/2 6.00 | Very Soft |

COLORED

| Number | 485 | 492 | 493 | 494 | 495 | 496 | 497 |
|----------------|--------|----------|--------|-----------|-------|--------|-------------|
| Color | Violet | Pink | Orange | *Black | Brown | Yellow | Terra Cotta |
| Diameterinches | | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 |
| Length " | | 41/2 | 41/2 | 41/2 | 41/2 | 41/2 | 41/2 |
| Priceper gross | 10.80 | 10.80 | 10.80 | 10.80 | 10.80 | 10.80 | 10.80 |
| Number | 520 | 5201/2 | 521 | 5211/2 | 522 | 523 | |
| Color | Red | Soft Red | Blue | Soft Blue | Green | White' | |
| Diameterinches | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | 1/2 | |
| Length " | 41/2 | 41/2 | 41/2 | 41/2 | 41/2 | | |
| Priceper gross | 10.80 | 10.80 | 10.80 | 10.80 | 10.80 | 10.80 | |

SOLID-ROUND

| | | | | 00.10 | | | | |
|-----------------|-------|-------------|--------------|-------------|------------|------------|----------|--------|
| Number | 786 | 380 | 382 | 384 | 385 | 386 | 387 | 1500 |
| Color | Blue | Terra Cotta | Green | Black | Yellow | Red | Brown | Violet |
| Diameter inches | 516 | 516 | 5/16 | 5 <u>16</u> | 516 | <u>⁵16</u> | 5∕16 | 516 |
| Length " | 7 | 7 | 7 | 7 | 70 | 7 | 7 | 7 |
| Priceper gross | -9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 |
| Number | 1501 | 1502 | 1503 | 1514 | 1515 | 1516 | 1517 | 1518 |
| Color | Pink | Orange | Sepia | Grav | Dark Olive | Light Blue | Sky Blue | White |
| Diameter inches | 56 | 516 | 5 <u>1</u> 6 | 5/16 | <u>516</u> | 516 | 516 | 5/6 |
| Length " | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| Priceper gross | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 |

SOLID-HEXAGON

| Number. | 904 | 905 | 906 | 907 | 908 | 909 | 1506 | 1507 | 1508 | 1509 |
|----------------|------|-------|--------|------|-------------|-------|--------|------|--------|-------|
| Color | Red | Black | Yellow | Blue | Terra Cotta | Green | Violet | Pink | Orange | Sepia |
| Diam . inches | 5,16 | 5/6 | 5/6 | 516 | 5/6 | 516 | 5/6 | 5/6 | 5/6 | 516 |
| Length. " | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| Price per gro. | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 | 9.00 |

METAL WORKERS'



Fig. 7764B

| Number | 524 | 5241/2 |
|-------------|------------------|--------|
| Widthinches | 1/2 | 114 |
| Thickness | 3 <u>1</u> 6 | 3/16 |
| Length | $\frac{3}{3.00}$ | 3.75 |

STEEL NAME STAMPS, FIGURES AND LETTERS





Fig. 5990A

Fig. 5990B

STEEL NAME STAMPS

| | | | | | | | | - | | | | | | | |
|------------------------------|------------------|--------|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| Size inches Price per letter | 3 ¹ 2 | 20 10 | 112 | 10 | 1/8 | 8 2 | 18 | 14 | 15 | 3/8 | 1/2 | 58 | 3/4 | 7/8 | 1 |
| Price per letter | .20 | .15 .1 | .15 | . 15 | .15 | .18 | .20 | .25 | .30 | .40 | .50 | .75 | 1.00 | 1.25 | 1.50 |

STEEL FIGURES AND LETTERS

| Size inches | 8 ¹ 2 | 2 ¹ 0 | 1 d | 8 2 | 18 | 852 | 18 | 1/4 |
|--------------------------------------|---------------------|----------------------|---------------|----------------------|----------------------|----------------|----------------|--------------|
| Price, Figuresper set "Alphabet" | 2.00 6.00 | 1.50 4.50 | 1.50 4.50 | 1.50 4.50 | 1.50 4.50 | 1.75 5.00 | 2.00 6.00 | 2.35 7.00 |
| Size inches | 5 | 3/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1 | |
| Price, Figures per set " Alphabet " | $\frac{3.00}{9.00}$ | $\frac{3.65}{11.00}$ | 4.50 14.00 | $\frac{6.50}{20.00}$ | $\frac{9.00}{27.00}$ | 11.50 33.50 | 13.50 40.00 | |

LOG MARKING HAMMER







Fig. 5990C



Fig. 5990D

LOG MARKING HAMMERS

| Price, 1 to 3 letterseach | 2.00 |
|----------------------------|------|
| " Special Design of Hammer | 3.50 |

ADJUSTABLE BRANDING IRONS

| Size . | | | | | | | | in | ches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 |
|--------|-------|----|----|---------|------|------|------|----|------|------|------|------|------|------|------|
| Price. | Brand | of | 4 | Letters | | | | 0 | ach | 1.00 | 1.00 | 1.00 | 2.00 | 2.30 | 2.50 |
| " | " | " | 6 | " | | | | | и | 1.30 | 1.40 | 1.50 | 2.75 | 3.20 | 3.50 |
| " | u | " | -8 | " | | | | | " | 1.60 | 1.80 | 2.00 | 4.00 | 4.10 | 4.50 |
| " | u | +4 | 10 | " | | | | | " | 1.90 | 2.20 | 2.50 | 4.75 | 5.00 | 5.50 |
| " | u | 46 | 12 | и | | | | | u | 2.20 | 2.60 | 3.00 | 5.25 | 5.90 | 6.50 |
| 4. | u | и | 14 | u | | | | | " | 2.50 | 3.00 | 3.50 | 5.75 | 6.80 | 7.50 |

DYNAMITE



FIg. 2076A NITRO GLYCERINE

| Per Cent | 3 0 | 331/3 | 40 | 50 | 60 | 75 |
|----------------|------------|-------|----|----|-----------|------|
| Priceper pound | | | | | • • • • • | ···· |

We can furnish gelatine in same per cent at the same price as Nitro Glycerine. Powder and Ammonia Powder for ½ cent per pound less. Dynamite is put up in sticks 1¼x8 and ½x8 inches packed 10 pounds in carton; 5 cartons in a case.

We can furnish any of the Standard Brands of Dynamite.

JUDSON OR CONTRACTORS' POWDER

Put up in cases of 50 pounds, 4 bags to case..... per case

This Powder is 50% stronger than Black Powder and safer to use. It is adapted for all kinds of blastings where Black Powder has heretofore been used in Blasting Seamy Rocks, Tough Clays, Hard-Pan and Limestone Quarries and Stump Blasting. Always explode this Powder with a piece or stick of Dynamite, owing to the quantity used. Never attempt to fire it with fuse alone.

NOTE:—Express companies will not receive explosives of any kind, therefore all explosives must SAFETY FUSE be shipped by freight,



Fig. 2076B



50 Feet in a Coil. 6000 Feet in a Barrel.

DETONATING CAPS

XXXX Gold Medal Caps..... per thousand 14.00

100 in a Tin Box—10 Boxes in a Carton.

Detonating Caps cannot be packed and shipped with Dynamite.

SAFETY SQUIBS FOR FIRING BLASTS IN COAL MINES

Fig. 2076D

No. 1 (Yellow Label) Daddow and Beadle's or Powell's Rocket burns with a Flame.

For general use.
No. 3 (Red Label) Daddow and Beadle's burns with a spark. For use in Mines containing Gas or Fire Damp. Also suitable for general use.

Price, No. 1 or 3per case of ten thousand 20.00



SHIP AUGERS

FORD'S SHIP AUGERS WITH SCREW



WITHOUT SCREW

Fig. 5966B

| | | 12-114 | CHIV | VISI | | | | | |
|----------------|-------------|-----------------|-----------------|-----------------|-----------------|--------|--------|--------|--------|
| Size in 8ths | 4 and under | 41/2 | 5 | 51/2 | 6 | 6½ | 7 | 71/2 | 8 |
| Priceper dozen | 7.50 | 9.00 | 9.00 | 10.50 | 10.50 | 12.00 | 12.00 | 13,50 | 13.50 |
| Size in 8ths | 81/2 | 9 | $91/_{2}$ | 10 | 101/2 | 11 | 111/2 | 12 | 121/2 |
| Priceper dozen | 15.00 | 15.00 | 16.50 | 16.50 | 18.00 | 18.00 | 21.00 | 21.00 | 24.00 |
| Size in 8ths | 13 | $13\frac{1}{2}$ | 14 | $14\frac{1}{2}$ | 15 | 151/2 | 16 | 16½ | 17 |
| Priceper dozen | 24.00 | 27.50 | 27.50 | 31.50 | 31.50 | 38.00 | 38.00 | 57.00 | 57.00 |
| Size in 8ths | 171/2 | 18 | $18\frac{1}{2}$ | 19 | $19\frac{1}{2}$ | 20 | 201/2 | 21 | 211/2 |
| Priceper dozen | 72.00 | 72.00 | 86.00 | 86.00 | 101.00 | 101.00 | 115.00 | 115.00 | 130.00 |
| Size in 8ths | 22 | 221/2 | 23 | $23\frac{1}{2}$ | 24 | | | | |
| Priceper dozen | 130.00 | 144.00 | 144.00 | 158.00 | 158.00 | | | | |

18-INCH TWIST

| Size in 8ths | 4 and under | $4\frac{1}{2}$ | 5 | 51/2 | 6 | $6\frac{1}{2}$ | 7 | $7\frac{1}{2}$ | 8 |
|----------------|-------------|----------------|-------|-------|-------|----------------|-------|----------------|-------|
| Priceper dozen | 15.00 | 16.50 | 18.00 | 19.50 | 21.00 | 22.80 | 24.60 | 26.40 | 28.20 |
| Size in 8ths | 81/2 | 9 | 91/2 | 10 | 101/2 | 11 | 111/2 | 12 | 121/2 |
| Priceper dozen | 30.00 | 31.80 | 33.60 | 35,40 | 37.80 | 40.20 | 42.60 | 45.00 | 48.00 |
| Size in 8ths | 13 | 131/2 | 14 | 141/2 | 15 | 151/2 | 16 | | |
| Priceper dozen | 51.00 | 54.00 | 57.00 | 60.00 | 63.00 | 66.00 | 69.00 | | |

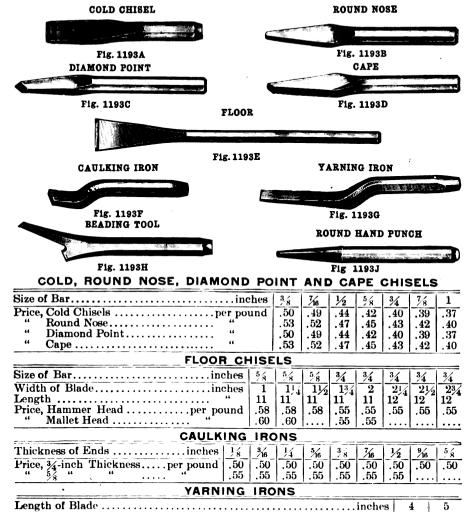
FORD'S RING SHIP AUGERS-With or Without Screw



| Size in 8ths | 1& under | 41/ | 5 | 514 | 6 | 614 | 7 | 714 | 8 |
|----------------|----------|-------------------|--------|--------|--------|--------|--------|--------|--------|
| Priceper dozen | 11.25 | $\frac{1}{12.90}$ | 12.90 | 14.55 | 14.55 | 16.20 | 16.20 | 17.85 | 17.85 |
| Size in 8ths | 81/2 | 9 | 91/2 | 10 | 101/2 | 11 | 111/2 | 12 | 121/2 |
| Priceper dozen | 19.50 | 19.50 | 21.15 | 21:15 | 22.80 | 22.80 | 26.10 | 26.10 | 29.40 |
| Size in 8ths | 13 | 131/2 | 14 | 141/2 | 15 | 151/2 | 16 | 161/2 | 17 |
| Priceper dozen | 29.40 | 33.25 | 33.25 | 37.65 | 37.65 | 44.80 | 44.80 | 62.70 | 62.70 |
| Size in 8ths | | | | | 191/2 | | | | |
| Priceper dozen | 79.20 | 79.20 | 94.60 | 94.60 | 111.10 | 111.10 | 126.50 | 126.50 | 143.00 |
| Size in 8ths | 22 | 221/2 | 23 | 231/2 | 24 | | | | |
| Priceper dozen | 143.00 | 158.40 | 158.40 | 173.80 | 173.80 | | | | |

Ring Ship Augers with 18-inch Twist Made to Order at ten per cent above prices of Regular 18-inch Twist Augers shown above.

CHISELS, CAULKING IRONS, ETC.



| Price, 34-inch | | | | | d .55 .55 | |
|--|-------------|------------------------------------|------------------------------|------------------------------|---|-----------------------|
| BEA | DING | TOOLS | <u> </u> | | | |
| Price | | | | | each | .75 |
| ROUND | HAND | PUNC | HES | | | |
| Sizeinches | 3/8 | 1/2 | 5,8 | 3,1 | 78 | 1 |
| Length inches Point " Approximate Weight per dozen Price per pound | 2 lb. 4 cz. | 6½ ½ ½ 16 4 lb. .38 | 7½ ½ ½ 7 lb. .38 | 814 3/16 10 lb. .38 | 8 ³ 4 14 15 lb. .38 | 91/4 5/6 21 lb. |

FINISHING TROWELS

No. 1



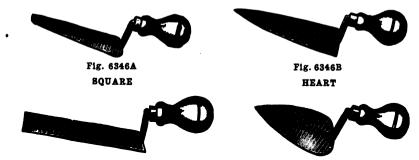


Fig. 6346C

Fig. 6346D

FINISHING AND SQUARE

| Leng | th | | | | | inches | 41/2 | 5 | 51/2 | 6 | 61/2 | 7 |
|-------|----------|---------------------------------|-------------|-------|------|------------|------|------|------|------|------|------|
| Price | , Finish | ing, 11/2 | incl | ies v | vide | each | | .60 | .65 | .70 | | |
| 46 | " | 114 | ' ." | | " . | " | | . 70 | .75 | .80 | .85 | .95 |
| 44 | 44 | 13 | · " | | " . | " | | .80 | .85 | .90 | .95 | 1.05 |
| " | Square | , 1 inc | h wic | le | | | .50 | .55 | .60 | .65 | | |
| 64 | •• | 114 i | nches | wid | le | " | .55 | .60 | .65 | .70 | | |
| 44 | ** | 11/3 | " | ** | | 44 | .65 | .70 | .75 | .80 | .85 | .95 |
| " | 44 | 1^{37} | 44 | 44 | | 66 | | .80 | .85 | .90 | .95 | 1.05 |
| 44 | 46 | $\mathbf{\tilde{2}}^{\prime 4}$ | " | ** | | 44 | | .90 | .95 | 1.00 | 1.05 | 1.15 |

HEART

| Width | .inobes | 2 | 21/4 | 212 | 3 |
|-------|---------|-----|------|-----|------|
| Price | | .60 | . 75 | .85 | 1.00 |

HEART AND SQUARE

TAPER AND SQUARE



HEART AND LEAF



Fig. 6346F HEART AND SQUARE SPOON



Fig. 6346G



Fig. 6346H

| | | | · ~ | | |
|-----------------------------------|---------------------|-----|-----|-----|---------|
| Price, Heart and Squareeach .4 | 5 .50 5 .50 | .60 | .70 | .80 | .90 |
| " Heart " Leaf " " Square Spoon " | 50 | .60 | .70 | | • • • • |

CIRCULAR FLANGE

FLAT FLANGE



Fig. 6460A

Fig. 6460B

| Widthinches | | 5/8 | 34 | 1 |
|-----------------------------|-----|------|------|------|
| Price, Circular Flangeseach | .90 | 1.00 | 1.10 | 1.30 |
| " Flat " " | .90 | 1.00 | 1.10 | 1.30 |
| " " and Circular Flanges " | .90 | 1.00 | 1.10 | 1.30 |

LIFTERS



| Leng | th | | | | | | | in | ches | 10 | 12 | 14 | 16 | 18 | 20 |
|--------|--------|-----|------|------|--------|------|----|----|------|------|------|------|------|------|------------|
| Price, | 1/8-ir | nch | wide | | | | ٠. | | each | .40 | .45 | .50 | .55 | | |
| ** | 14 | 44 | " | | | | | | " | . 45 | .50 | .55 | .60 | | |
| " | 3 % | " | 44 | | | | | | " | .50 | .55 | .60 | . 65 | | . |
| 44 | 1,2 | " | 46 | | | | | | " | . 55 | .60 | .65 | .70 | . 75 | |
| ** | 5/8 | " | 44 | | ٠. | | | | " | | .65 | .70 | .75 | .80 | |
| " | 34 | 44 | 44 | | | | | | " | ' | . 70 | . 75 | .80 | .85 | .90 |
| | 1 | " | 44 | | | | | | ** | | | .80 | .90 | .95 | 1.00 |

FLANGE LIFTERS



Size inches $\frac{1}{2} \times 14 \frac{1}{2} \times 16 \frac{3}{8} \times 14 \frac{5}{8} \times 16 \frac{3}{4} \times 16 \frac{3}{4} \times 16 \frac{3}{4} \times 16 \frac{3}{4} \times 18 \frac{1}{1} \times 16 \frac{1}{1} \times 18 \frac{1}{1} \times 20$ Price each $\frac{1}{1.05}$ 1.10 1.10 1.15 1.15 1.20 1.25 1.30 1.35 1.40

HUB LIFTERS



Fig. 6460E

 Size
 inches
 $\frac{1}{2}$ x $\frac{12}{2}$ x $\frac{12}{2}$ x $\frac{14}{2}$ x $\frac{16}{3}$ x $\frac{14}{3}$ x $\frac{16}{3}$ x $\frac{16}{4}$ x $\frac{18}{4}$ x $\frac{16}{3}$
BOX LIFTERS



| Sizeinches | ⁵ g x 14 ⁵ g x 16 | 5 8 x 18 3 4 x 16 | 34 x 18 34 x 20 |
|------------|---|-------------------|-----------------|
| Priceeach | 1.10 1.15 | 1.20 1.20 | 1.25 - 1.30 |

TAPER AND SQUARE No. 2



Fig. 6357A

No. 1 SPOON



Fig. 6357C

SLICK AND OVAL SPOON

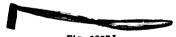


SLICK AND BEAD



Fig. 6357G

BENCH LIFTER No. 1



Pig. 6357J





Fig. 6357L

DOUBLE SQUARE



Fig. 6357B

No. 2 SPOON



Fig. 6357D

SLICK AND SQUARE SPOON



GATE CUTTER



Fig. 6357H

BENCH LIFTER No. 2



Fig. 6357K

YANKEE No. 2



| Width | 1 14 | 3 8 | 1/2_ | 58 | 34 | 1 | 11/8 | 11/4 | 11/2 |
|------------------------------------|------|---------|----------|------------|-----|-----|-----------|------------|------|
| Price, Taper and Sqr., No. 2. each | | | | | .45 | .50 | | .60 | .70 |
| " Double Square " | | | | .55 | .60 | .65 | . | | |
| " Spoons, Nos. 1 or 2 " | | | . | | | .50 | | .60 | .70 |
| " Slick and Oval Spoons " | | · | | | .45 | .50 | 1 | .60 | .70 |
| " " Square " " | | | | | | | .60 | l <i>.</i> | |
| " " Beads " | | | | . . | .50 | .55 | | | |
| " Gate Cutters " | | · | .50 | .55 | | | | | |
| " Bench Lifters No. 1." | .35 | . 45 | .50 | .55 | .60 | | | | |
| " " No.2 " | .35 | .45 | .50 | .55 | .60 | | 1 | | |
| "Yankee. No. 1 " | | .45 | .50 | .55 | .60 | .70 | 1 | | |
| " " No. 2 " | 1 | . 45 | .50 | .55 | .60 | .70 | . | | 1 |

STOVE TOOLS

No. 1 STOVE

No. 2 STOVE



Fig. 6424A

No. 3 STOVE



Fig. 6424B

HEART STOVE



Fig. 6424C

OVAL STOVE



Fig. 6424D

LEAP STOVE



Fig. 6424E



Fig. 6424F

CORNER SLICKS

HALF ROUND



Fig. 6424G

Fig. 6424H

SQUARE

INSIDE SQUARE



Fig. 6424J

PIPE



Fig. 6424K

HUB TOOL

FLANGE AND BEAD



Fig. 6424L



Fig. 6424M

| Widt | h inches | 3 % | 1/2 | 5/8 | 3/4 | 1 | 11/4 | 112 | 2 | $2\frac{1}{2}$ | 3 |
|-------|--------------------------|-----|-----|-----|-----|------|------|-----|-----|----------------|-----|
| Price | Stoves No. 1each | .45 | .50 | .55 | .60 | .65 | | | | | |
| +4 | · " 2 " | 1 | ١ | .40 | .45 | | | | | ١ ا | |
| " | " " 3 " | | | .40 | .45 | | ١ | | | ١ ا | |
| 46 | Heart Stoves " | | | .40 | .45 | | | | | | |
| . " | Oval " " | | | | | | | | | | |
| 66 | Leaf "" | 1 | 1 | | .45 | | ١ | | | i l | |
| 66 | Half Round Corner " | 1 | l | | | | | | .65 | ا ا | |
| 44 | Square Corner " | | | | | | | | .60 | .65 | .70 |
| 46 | Inside Square Corner . " | 1 | | ١ | | | | | .75 | .80 | |
| 68 | Hub Tools" | 1 | 1 | | NO. | | | | | | |
| 46 | Flanges and Beads " | 1 | .80 | .90 | | 1.20 | | | | | |

PIPE

| | = | |
|-------|---|----------------|
| Price | | each .50 |

CRUCIBLES



Fig. 5686A

| | | | | Fi | g. 5686A | | | | | |
|--------|---------------|---------------|----------------|-----------------------------|----------------------------------|------------------------------------|-------------------------------------|-----------------------|---------------|-----------------------|
| Number | Acr | UAL CAPAC | CITY | Height Outside Inches | Diameter at Top Outside | Diameter at Bilge Outside | Diameter at Bottom Outside | Price per Dozen | Price Each | Price per Numbe |
| | Gallons | Quarts | Pints | | Inches | Inches | Inches | Dozen | | |
| 0 | | | | 2 | 11/2 | 11/2 | 11/4 | 1.80 | | |
| 00 | | | | 21/4 | 17/8 | 17/8 | 13/8 | 1.80 | | |
| 000 | | | | 21/2 | 2 | 2 | 11/2 | 1.80 | | |
| 0000 | | | 1/4 | 3 | $2\frac{3}{8}$ | 23/8 | 13/4 | 1.80 | | 1 |
| 1 | | | 1/4 1/2 | 35/8 | 31/4 | 31/8 | 21/4 | | .25 | |
| 2 | | | 34 | 41/2 | 334 | 35/8 | 27/8 | | .30 | |
| 3 | | | 1 | 514 | 41/4 | 41/8 | 3 | | .35 | |
| 4 | 1000 | | 11/2 | 55/8 | 45/8 | 45/8 | 31/4 | 1 | .40 | |
| 5 | | | 13/4 | 6 | 47/8 | 47/8 | 31/2 | | .45 | 1 |
| 6 | | 1 | 12 | 63% | 514 | 51/8 | 37/8 | | .50 | |
| 7 | | î | 1/2 | 634 | 51/2 | 51/2 | 4 | | .55 | |
| 8 | | 1 | 1 2 | 71/4 | 534 | 57/8 | 414 | | .60 | |
| 9 | | 1 | 11/2 | 71/2 | 6 | 61/4 | 45% | | .65 | |
| 10 | | | 1/2 | 715/2 | 61/8 | 61/2 | 43/4 | | .70 | |
| 12 | | $\frac{2}{2}$ | 1/ | 8 8 | 63/ | 63/ | | | | 001/ |
| 14 | | 2 | 1/2 | | 63/8 | | 514 | | | .061/2 |
| | | 3 | 11/2 | 81/2 | 67/8 | 73/8 | 55/8 | | | .061/2 |
| 16 | | 3 | 1/4 | 834 | 7 | 71/2 | 55/8 | | | .061/2 |
| 18 | 1 | | | 934 | 71/2 | 8 | 53/4 | | | .061/2 |
| 20 | 1 | | 1 | 101/8 | 77/8 | 83/8 | 6 | | | .061/2 |
| 25 | 1 | 1 | 1/2 | $10^{5}/_{8}$ | 81/2 | 815/16 | 63/8 | | | .061/2 |
| 30 | 1 | 1 | $1\frac{1}{2}$ | 111/4 | 834 | 9316 | 65/8 | | | .061/2 |
| 35 | 1 | 3 | 1/2 | 115/8 | 91/8 | 93/4 | 7 | | | .061/2 |
| 40 | 2 | | 1 | 121/8 | 93/8 | 1014 | 73/4 | | | .061/2 |
| 45 | $\frac{2}{2}$ | 1 | 1 | 13 | 97/8 | 101/2 | 75/8 | | | .061/2 |
| 50 | 2 | 3 | 3/4 | 131/2 | 101/4 | 111/4 | 8 | | | .061/2 |
| 60 | 3 | | 1 | 14 | 105/8 | 115% | 81/8 | | | .061/2 |
| 70 | 3 | 1 | 1/2 | 141/2 | 1034 | 117/8 | 83/8 | | | .061/6 |
| 80 | 3 | 3 | 1 | 151/8 | 1114 | 123% | 85/8 | | | .061/2 |
| 90 | 4 | 2 | | 1534 | 115/8 | 1215 | 91/2 | | | .0613 |
| 100 | 4 | 2 | 1 | 16 | 117/8 | 131/8 | 93% | | | .0616 |
| 125 | 5 | 10000 | 1 | 165/8 | 121/2 | 1334 | 91/2 | | | .061/5 |
| 150 | 6 | 2 | 1 | 1814 | 1314 | 1434 | 101/2 | | | .061/2 |
| 175 | 8 | | - | 195% | 1414 | 153/ | 1034 | | | .061/2 |
| 200 | 9 | 1 | 1 | 2014 | 15 | 165% | 113% | | | .061/2 |
| 225 | 10 | 1 | 1 | 205/8 | 151/2 | 163/4 | 121/2 | | | .061/2 |
| 250 | 10 | 2 | 1 | 2034 | 153/8 | 17 | | | | 7.0 |
| 275 | 11 | 1 | 1 | 221/2 | 151/8 | 17 | 111/2 | | | .061/2 |
| 300 | 12 | 1 | 1 | | 1514 | | 121/2 | | | .061/2 |
| | | 1 | | 2214 | 1614 | 171/2 | $12\frac{1}{2}$ | | | .061/2 |
| 400 | 16 | | | 24 | 165% | 193% | 14 | 12000 | 2000 | 061/6 |

COVERS

| Number | 0 to 0000 | 1 to 5 | 6 to 10 | 12 to 20 | 25 to 300 |
|--------|-----------|--------|---------|----------|------------|
| Price | Per Dozen | | Each | | Per Number |
| THEC | 1.50 | .15 | .20 | .25 | .01 |

MOLDERS' SOFT DUSTERS OR DRY BRUSHES

WIRE DRAWN









WIRE DRAWN

| Number | 0200 | 200XX | 200X | 200 | 205 |
|------------------|------------------------------------|-----------|--|------------|-----------|
| Number of Rows | 4 | 4 | 4 | 4 | 5 |
| Triminches | 27/8 | 3 | $2\frac{7}{8}$ | 31/4 | 31/2 |
| Kind of Bristle | Black | Mixed | Gray | Gray | Black |
| Size Blockinches | $9\frac{1}{8} \times 1\frac{1}{4}$ | 81/2×11/2 | 81/2×11/2 | 81/2×11/2 | 10x2 |
| Priceper gross | 54.00 | 60.00 | 80.00 | 90.00 | 80.00 |
| Number | 208 | 2088 | 208B | 258 | 259 |
| Number of Rows | 5 | 5 | 5 | 5 | 5 |
| Triminches | 21/2 | 31/4 | 21/2 | 21/2 | 3 |
| Kind of Bristle | Black | Gray | American | Mixed | Mixed |
| Size Blockinches | 83/4 x25/6 | 834 x256 | $8\frac{3}{4}$ x $2\frac{5}{6}$ 114.00 | 83/4 x25/6 | 83/8×21/2 |
| Priceper gross | 78.00 | 96 00 | 1114 00 | 120 00 | 146 00 |

| SET WITH CEMENT | FT | WIT | 1 C | EM | ENT | • |
|-----------------|----|-----|-----|-----------|-----|---|
|-----------------|----|-----|-----|-----------|-----|---|

| Number | 250 | 129 | 120 | 206 | 131 | 132 |
|----------------------------|----------------|---------|---------|------------------|----------|----------------|
| Number of Rows | 4 | 4 | 4 | 5 | 4 | 4 |
| Triminches Kind of Bristle | $2\frac{7}{8}$ | 3 | 21/2 | 3. | 21/2 | $2\frac{1}{2}$ |
| Kind of Bristle | Black | Russia | Mixed | Mixed | Mixed | Mixed |
| Size Block inches | 9 1 1/6 | 934×114 | 936x116 | '10¼ x1 ¾ | 91/x11/6 | 77%×13% |
| Priceper gross | 84.00 | 102.00 | 96.00 | 120.00 | 92.00 | 120.00 |





HANDLED, SET WITH CEMENT



Fig. 5854C

WIRE DRAWN

Fig. 5854D

| Number | 216 | 217 |
|-----------------------------|------------|----------------------|
| Number of Rows | 5 | 6 |
| Trim inches Kind of Bristle | Mired Heir | Dura Plack |
| Size Blockinches | 81/x23/6 | 85/ v 21/ |
| Priceper gross | 75.00° | 150.00 |

HANDLED

| Number | 209 | 210 | 425 | 426 | 427 |
|--|-------|--------|-------|--------|--------|
| Number of Rows. Triminches Kind of Bristle | 5 | 5 | 5 | 5 | 5 |
| Triminches | 3 | 3 | 27/8 | 27 8 | 27/8 |
| Kind of Bristle | Gray | Gray | Black | Black | Black |
| Tongth of Blook Over All inches | 1912 | 1 111/ | 1111 | 1 1.1 | 1.15 |
| Price | 75.00 | 90.00 | 90.00 | 105.00 | 120.00 |

BROOMS AND DUSTERS



NAILED STEEL BAND WARE-HOUSE AND MILL BROOMS

These Brooms have good hard-wood handles, with heavy steel bands; very securely put together with plenty of wrought iron nails.

| Number | | Weight Per Dozen Pounds | Price per Dozen |
|--------|-----------------------------|-------------------------------|-----------------------|
| 326 | All Corn No. 4 | 36 | 5.00 |
| 226 | Corn and No. 4 Rattan Mixed | 35 | 5.50 |
| 225 | Corn and No. 3 Rattan Mixed | 30 | 5.00 |
| 232 | Victor All Rattan | 33 | 6.00 |
| 231 | No. 4 All Rattan | 35 | 7.00 |

COUNTER AND BENCH OR SHOP DUSTERS





BENCH DUSTER



Fig. 2368B

Fig. 2368C

| | Counter | e Dustens | BENCH OR | SHOP DUSTERS |
|-------------|----------------|--------------------|-----------|-----------------|
| Description | Gray Tampico | Pure Bristie, Gray | Mixed | Extra Stiff |
| | Fibre, Pitched | Body, Pitched | Gray Hair | Pure Black Hair |
| Number | 412 | 416 | 422 | 427 |
| | 9 | 9 | 9 | 9 |
| | 60.00 | 108,00 | 90,00 | 120.00 |

CLEVELAND PATTERN LETTERS AND FIGURES

PRICE LIST

ROMAN

SHARP FACE ROUND PACE

Adopted by Manufacturers Dec. 17, 1908 PLAT FACE No. 1

FLAT FACE GOTHIC No. 2



Fig. 5718A HAIR LINE COTHIC





Fig. 5718C CONDENSED THIN ROMAN



Fig. 5718D



Fig. 5718E REVERSED REVERSED ROMAN BRANDING GOTHIC BRANDING



Pig. 5718P











Fig. 5718H "DIE CAST" WHITE METAL All Styles Excepting Brands

| Sizeinches | * 32 | 18 | 3/6 | 14 | 516 | 3/8 | 716 | 1/2 | 916 | 5 8 |
|--------------------|------|------------------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Priceper 100 | 3.00 | 2.00 | 2.00 | 2.00 | 2.00 | 2.50 | 3.00 | 3.00 | 4.00 | 4.00 |
| Sizeinches | 34 | 78 | 1 | 11/4 | 11/2 | 134 | 2 | 21/2 | 3 | 4 |
| Priceper 100 | 5.00 | $\overline{6}.\overline{00}$ | 7.00 | 10.00 | 15.00 | 20.00 | 30.00 | 40.00 | 50.00 | 60.00 |
| *Face Measurements | | OTULO | | | | | | - | | |

| 1 40 | 0 1/204 | Jun 0 | шод об | |
|------|---------|-------|--------|--|
| | | | | |
| === | | | | |

| GOTHIC | AND | ROM | AN B | RANDS |
|--------|-----|-----|------|-------|
| | | | | |
| | | | | |

| 111ccpc1 100 | 1.00 | | | BRASS | | 11.00 | 12.00 | 10.00 | 00.00 | • • • • • |
|--------------|------|------|----------|-------|-------|-------|-------|-------|-------|-----------|
| Priceper 100 | 4 00 | 6 00 | 8.00 | 9 00 | 10.00 | 11 00 | 12.00 | 15 00 | 30.00 | |
| Sizeinches | 4 | % | ½ | 78 | 34 | 1 | 114 | 11/2 | 2 | |

7/6 Size.....inches 16 1,7 5/6 3/8 1/2 Price.....per 100 | 5.00 | 4.00 | 4.00 | 4.00 | 5.00 | 5.00 | 5.00 6.00 + 6.0078 $11_4^{-1} \cdot 11_2^{-1} \cdot 13_4^{-1}$ 34 Size.....inches 1 2 | 21/2 | 3 4 9.00 12.00 18.00 25.00 30.00 40.00 50.00 60.00 Price....per 100 | 7.00 | 8.00

*Face Measurements

BRASS

Gothic and Roman Brands

34 3/8 1/2 56 Size.....inches 14 11/2 114 Price....per 100 | 7.00 | 8.00 | 8.00 | 9.00 | 10.00 | 12.00 | 15.00 | 20.00 | 30.00 | 60.00

POLISHED FLAT GOTHIC AND ROMAN-"DIE CAST" Add 10% Net Extra for Polishing

| | | | | - |
|------------|-------------------------|----------------------|------------|-------|
| Sizeinches | 1 1/4 5/6 3/8 | 7/16 1/2 9/16 | 58 34 | 1 7.5 |
| Priceeach | $.04 \mid .04 \mid .05$ | .05 + .05 + .06 | .06 .07 | 08 |
| Sizeinches | 1 114 11/2 | $1^{3}4$ 2 $2^{1}/2$ | $-3^{-1}4$ | |
| Priceeach | .09 .12 .18 | .25 .30 .40 | .50 .60 | |

BRASS ROMAN-"DIE CAST" Cement. Sidewalk or Harness Letters

| | | | _ | | | | | |
|-------|---------|------------------------|------|--------------|-----|------|-----|------|
| Sizei | nches | 1 11, | 11/2 | 134 | 2 | 21/2 | 3 | 4 |
| Price | .each . | $09\overline{}$. 12 | .18 | 25° | .30 | . 40 | .50 | . 60 |

LEATHER AND WOOD FILLETS. ETC. PERFECT LEATHER FILLETS

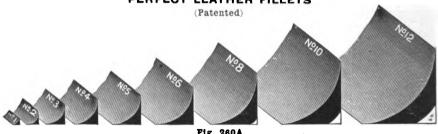


Fig. 260A

| Number | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 |
|---|------|---------------------|--------------------|--|-------------------------------------|---------------------|--------------------|---|---------------------|------------------------|------------------|
| Size or Radiusinches Width of Flat Face " Priceper 100 feet | 2.00 | 1/8 8/16 2.00 | 3.6 5.6 3.00 | $\frac{\frac{1}{3}}{\frac{4}{8}}$ 4.00 | $\frac{^{5}_{16}}{^{1}_{2}}$ 5.00 | 3/8 9/16 6.00 | 1/2 3/4 8.00 | $\frac{\overset{5}{\overset{3}{\overset{1}{\overset{1}{\overset{1}{\overset{1}{\overset{3}{\overset{1}{1$ | 1_{3}^{5} 12.00 | $1\frac{7}{8}$ 14.00 | 1 1% 16.00 |

Conforms and adjusts as easily to single and compound curves as to straight work. Put up in lengths of 4 feet and packages of 100 feet.

PERFECT WOOD FILLETS A NEW CONSTRUCTION

OBTUSE ANGLE

Fig. 260B

Our Perfect Wood Fillet is constructed upon an obtuse angle, the back being worked sufficiently more than 90 degrees, to permit the feather edges to press firmly to the pattern. when applied.

Made of the best clear white pine, kiln dried and free from knots, shakes, sap and

Worked perfect in curve to feather edge. Carefully selected, no haggled edges.

Guaranteed entirely as represented. Cheap. convenient and economical for straight work. "The best."

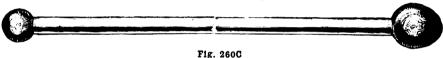
| Number | . 4 | 6 | 8 | 10 | 12 | 14 | 16 |
|--|------|----------------------|------|------|------|-------------|-----------|
| Size or Radiusinches Priceper 100 feet | 2.00 | $\frac{3}{8}$ 2.50 | 3.00 | 3.50 | 4.00 | 7/8 4.50 | 1 5.00 |

DIRECTIONS FOR APPLYING FILLETS

LEATHER: -Place Fillet face down, apply ordinary glue for wood patterns, shellac for metallic patterns or old work; press to position with a round stick, the diameter of which is double the "size" or "radius" of Fillet applied (i. e., in applying a "¼-inch" Fillet, use a round stick ½-inch in diameter, etc.,) and remove surplus glue with a damp cloth.

Wood: - Shellac face or curved side of Fillet a few moments before applying.

FILLET TOOLS



| Number | 1 | 2 | 3 | 4 |
|-----------------------|------|----------|---------|---------|
| Size Fillet forinches | | 36-14 | 516-3 s | 1/2-5 8 |
| Priceeach | . 15 | .30 | ,45 , | .60 |

Price per set, 1.50

DIAGRAM SHOWING ACTUAL SIZE OF U.S. GAUGE

| NO. | WIRE | GACI | NO. | SHEET N | METAL | AUG |
|--------------|------|------------------|----------|---------|----------------------|--------------------|
| 00 | | .331 | 00 | | .34375 | 11 32 |
| 0 🔘 | | .307 | 0 | | .3125 | <u>5</u> 16 |
| 1 | | .283 | 1 | | .28125 | <u>9</u> 32 |
| 2 🔾 | | .263 | 2 | | . 26 5625 | 17 64 |
| 3 | | .244 | 3 | | .25 | 1 |
| 4 | | .225 | 4 | | .23 4375 | 15 64 |
| 5 🔾 | | .207 | 5 | | .21875 | <u>7</u> 32 |
| 6 🔾 | | .192 | 6 | | .203125 | 13 64 |
| 7 🔾 | | .177 | 7 | | .1875 | <u>3</u> 16 |
| 8 🔾 | |] .162 | 8 | | .171875 | 11 · |
| 9 🔘 | | .148 | 9 | | .15625 | <u>5</u> 32 |
| 10 🔘 | | .135 | 10 | | .140625 | 9 64 |
| 11 () | | .120 | 11 | | .125 | 1 8 |
| 12 (| | .105 | 12 | | .109375 | 7 64 3 32 |
| 13 O | | .092 | 13 | | .09375 | <u>3</u> 32 |
| 14 O 15 O | | .08 .072 . | 14 15 | | .078125 .0703125 | <u>5</u> 64 |
| 16 0 | | 1.063 | 16 | | .0625 | <u>1</u> 16 |
| 17 0 | | .054 | 17 | | 05625, ا | |
| 18 o 19 o | | □ .047 □ .041 | 18 19 | | .05 .04375 | 20 |
| 20 0 | | □ .035 | 20 | | .0375 | |
| 21 • | | 032 | 21 22 | | 034375 03125 | 1 32 |
| | | | 23 24 | | .028125 .025 | 32 |
| | | | 25 | | .021875 | |
| | | | 26 27 | | · .01875 ·0171875 | |

Fig. 2820A

SHEET IRON AND STEEL

WEIGHTS OF SHEET IRON AND STEEL -Standard Gauges

| | U. | 8. STANDARD | GAUGE | | 1 | BIRMIN | GRAM GAUG | 2 |
|-----------|-----------------|--------------|----------|-------------|--------|-------------------|--------------|-------------|
| No. of | Thickne | ss in Inches | | Square Foot | No. of | Thick- ness in | Weight per l | Square Foot |
| Gauge | Fractions | Decimals | Iron | Steel | Gauge | Inches | Iron | Steel |
| 0000000 | 1/2 | .5 | 20.00 | 20.4 | | | | · |
| 000000 | 15/32 | .46875 | 18.75 | 19.125 | | | 1 | |
| 00000 | 7/6 | .4375 | 17.50 | 17.85 | | | | |
| 0000 | 18/82 | .40625 | 16.25 | 16.575 | 0000 | . 454 | 18.22 | 18.46 |
| 000 | 3/8 | .375 | 15. | 15.30 | 000 | .425 | 17.05 | 17.28 |
| 00 | 11/82 | .34375 | 13.75 | 14.025 | 00 | .38 | 15.25 | 15.45 |
| 0 | 5/6 | .3125 | 12.50 | 12.75 | Ö | .34 | 13.64 | 13.82 |
| 1 | 9/82 | .28125 | 11.25 | 11.475 | 1 | .3 | 12.04 | 12.20 |
| $ar{2}$ | 17/64 | . 265625 | 10.625 | 10.8375 | 2 | .284 | 11.40 | 11.55 |
| $\bar{3}$ | 1/4 | .25 | 10. | 10.2 | 3 | . 259 | 10.39 | 10.53 |
| 4 | 15/64 | .234375 | 9.375 | 9.5625 | 4 | . 238 | 9.55 | 9.68 |
| 5 | 7/32 | .21875 | 8.75 | 8.925 | 5 | .22 | 8.83 | 8.95 |
| 6 | 13/64 | .203125 | 8.125 | 8.2875 | 6 | . 203 | 8.15 | 8.25 |
| 7 | 8/0 | . 1875 | 7.5 | 7.65 | 7 | .18 | 7.22 | 7.32 |
| 8 | 3/6 11/64 | .171875 | 6.875 | 7.0125 | 8 | .165 | 6.62 | 6.71 |
| 9 | 5/82 | .15625 | 6.25 | 6.375 | ∥ ŏ | .148 | 5.94 | 6.02 |
| 10 | 9/64 | .140625 | 5.625 | 5.7375 | 10 | 134 | 5.38 | 5.45 |
| ii | 1/8 | .125 | 5. | 5.1 | l ii | .12 | 4.82 | 4.88 |
| 12 | 764 | .109375 | 4.375 | 4.4625 | 12 | .109 | 4.37 | 4.43 |
| 13 | 3/82 | .09375 | 3.75 | 3.825 | 13 | .095 | 3.81 | 3.86 |
| 14 | 5/84 | .078125 | 3.125 | 3.1875 | 14 | .083 | 3.33 | 3.37 |
| 15 | 9/128 | .0703125 | 2.8125 | 2.86875 | 15 | .072 | 2.89 | 2.93 |
| 16 | 1/6 | .0625 | 2.5 | 2.55 | 16 | .065 | 2.61 | 2.64 |
| 17 | 9160 | .05625 | 2.25 | 2.295 | 17 | .058 | 2.33 | 2.36 |
| 18 | 1/20 | .05025 | 2.20 | 2.04 | 18 | .049 | 1.97 | 1.99 |
| 19 | 720 7160 | .04375 | 1.75 | 1.785 | 19 | .042 | 1.69 | 1.71 |
| 20 | 8/80 | .0375 | 1.50 | 1.53 | 20 | .035 | 1.40 | 1.42 |
| 21 | 11/820 | .034375 | 1.375 | 1.4025 | 21 | .032 | 1.28 | 1.30 |
| 22 | 1/820 | .03125 | 1.25 | 1.275 | 22 | .028 | 1.12 | 1.14 |
| 23 | 9/820 | .028125 | 1.125 | 1.1475 | 23 | .025 | 1.00 | 1.02 |
| 24 | 1/40 | .025 | 1.120 | 1.02 | 24 | .023 | .883 | .895 |
| 25 | 7,320 | .021875 | .865 | .8925 | 25 | .02 | .803 | .813 |
| 26 | 3/160 | .01875 | .75 | .765 | 26 | .018 | 722 | .732 |
| 27 27 | 11/640 | .0171875 | .6875 | .70125 | 27 | .016 | .642 | .651 |
| 28 | 1/64 | .015625 | .625 | .6375 | 28 | .014 | .562 | .569 |
| 29 | 9/840 | .0140625 | .5625 | .57375 | 29 | .013 | .522 | .529 |
| 30 | 7840 1/80 | .0125 | .5 | .51 | 30 | .013 | .482 | .488 |
| 31 | 780 7640 | .0109375 | .4375 | . 44625 | 31 | 012 | .401 | .407 |
| 32 | 7840 13/1280 | .0109373 | .40625 | .414375 | 32 | .009 | .361 | .366 |
| 33 | 3/320 | .009375 | .375 | .3825 | | | .301 | .300 |
| 34 | | | | | 33 | .008 | | |
| 34 35 | 11/1280 | .00859375 | .34375 | .350625 | 34 | .007 | .281 | .285 |
| | 5/640 | .0078125 | .3125 | .31875 | 35 | | .201 | .203 |
| 36 | 9/1280 | .00703125 | . 28125 | . 286875 | 36 | .004 | | |
| 37 | 17/2560 | .006640625 | . 265625 | | | | | |
| 38 | 1/160 | . 00625 | . 25 | . 255 | 38 | | | |

Sheet mills roll iron and steel sheets to U. S. standard gauge unless otherwise ordered. Plate mills usually roll heavy plates \(\frac{1}{2} \), and heavier, and light plates No. 8 to No. 12 to Birmingham gauge.

The low temperature (as compared with iron) at which steel plates have to be finished, causes a slight springing of the rolls, leaving the plate thicker in the center than on the edge. This is especially noticeable in plates less than \(\frac{1}{2} \), inch thick and over 66 inches wide, which may be of full thickness on the edge and yet be as much as \(\frac{1}{2} \), inch thicker in the middle.

See Variations for Overweight, as adopted by Association American Steel Manufacturers.

SHEET STEEL



Fig. 1043A BLACK SHEETS, EXTRAS PER 100 POUNDS-WIDTHS

| | -, | | | | | | | | | |
|----------------------------|-------|--------|------|--------|------|------|------|-----|-------|-------|
| No. 10 to 16 Gauge | | .15 to | 48 | inches | wide | e | | No | Extra | ı |
| No. 10 " 16 " | | 48 " | 72 | 44 | 66 | | .25 | per | 100 p | ounds |
| No. 10 " 16 " | | | . 72 | 44 | 44 | | . 75 | "" | 100 | 44 |
| No. 16 Gauge and heavier ! | | 15 to | | 44 | 44 | | .10 | 66 | 100 | 44 |
| No. 16 " " " | 66 | 12 " | 9 | 44 | 44 | | .20 | 66 | 100 | 44 |
| No. 16 " " " | 44 | 9 " | 6 | 46 | 44 | | .30 | .66 | 100 | 66 |
| No. 17 and 18 Gauge | | .20 " | 36 | 44 | 44 | | .00 | No | Extra | |
| No. 17 " 18 " | | | 48 | 66 | 46 | | 25 | | | ounds |
| No. 17 " 18 " | Under | 20 " | 12 | 44 | 66 | | .10 | 166 | 100 | " |
| No. 17 " 18 " | " | 12 " | 9 | 44 | 66 | | .20 | " | 100 | 44 |
| No. 17 " 18 " | 66 | 9 " | 6 | 41 | ** | | .30 | 66 | 100 | a |
| No. 19 Gauge and lighter | 66 | 24 " | 12 | 44 | 44 | | .20 | 66 | 100 | ** |
| No 10 " " " | 44 | 12 " | 9 | 46 | 44 | | .40 | 66 | 100 | 46 |
| N- 10 4 4 4 | 44 | 9 " | 6 | 44 | 44 | | .50 | 66 | 100 | 44 |
| | Over | 32 " | 36 | 44 | 46 | | .20 | 66 | 100 | 66 |
| No. 19 " 21 " | " | 36 " | 40 | 66 | 44 | | .30 | 44 | 100 | 44 |
| No. 19 " 21 " | 66 | 40 " | 44 | 44 | ** | | .40 | 66 | 100 | 44 |
| No. 19 " 21 " | 14 | 44 " | 48 | | ** | | .60 | 66 | 100 | 44 |
| No. 22 " 24 " | 44 | 32 " | | 44 | 44 | | .20 | 66 | 100 | 66 |
| No. 22 " 24 " | 46 | 36 " | 40 | 44 | 44 | | .40 | 44 | 100 | 44 |
| No. 22 " 24 " | 46 | 40 " | 44 | ** | 46 | | .80 | " | 100 | 66 |
| No. 22 " 24 " | 44 | 44 " | 48 | 44 | 66 | | 1.00 | 46 | 100 | 44 |
| No 25 " 26 " | 44 | 32 " | 36 | 66 | 66 | | .20 | 66 | 100 | 66 |
| No. 25 " 26 " | 46 | 36 " | 40 | 66 | ** | | .60 | 66 | 100 | 44 |
| N- 05 4 00 4 | 66 | 40 " | 44 | 44 | 66 | | .80 | 66 | 100 | 46 |
| No. 27 Gauge | 66 | 32 " | 36 | 66 | ** | | | 44 | 100 | " |
| ** OF # | " | 36 " | 40 | 66 | 44 | **** | .20 | 66 | | 66 |
| N- 97 " | 44 | 40 " | 44 | ** | 44 | | .80 | 66 | 100 | 66 |
| | 44 | | | 46 | 44 | | 1.00 | 66 | 100 | 66 |
| No. 28 " | 44 | 32 " | 36 | " | 46 | | .20 | 66 | 100 | 44 |
| NO. 40 | " | 90 | 40 | 44 | 44 | | .80 | " | 100 | " |
| No. 29 to 30 Gauge | | 32 " | 36 | | ** | | .40 | | 100 | |

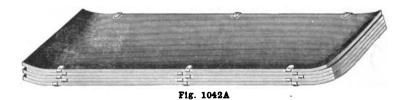
BLACK SHEETS, EXTRAS PER 100 POUNDS-LENGTHS

| No. 13 | Gauge | and | heavier | | .40 | in | ches | and | longer | No Extra |
|--------|---------|-------|---------|-------|-----|----|-------|-----|---------|------------------------|
| No. 14 | to 16 (| Jaug | e | | .40 | to | 144 i | nch | es long | " " |
| No. 14 | " 16 | " | | Over | | | 144 | 66 | 44 | .10 per 100 pounds |
| No. 16 | Gauge | and | heavier | Under | 40 | to | 30 | 66 | 64 | .10 " 100 " |
| No. 16 | ** | ** | 66 | 46 | 30 | 66 | 24 | 44 | 44 | .20 " 100 " |
| No. 16 | 1.6 | 66 | 44 | | 24 | 66 | 18 | 66 | 66 | .30 " 100 " |
| No. 17 | to 18 G | lauge | ð | | 48 | 66 | 132 | 66 | 66 | No Extra |
| | ." 18 | | | Over | | | 132 | 46 | 66 | .20 " 100 pounds |
| No. 17 | " 18 | " | | Under | 48 | " | 40 | 66 | 66 | .10 " 100 " |
| No. 17 | " 18 | 44 | | | | | 24 | 66 | 44 | .20 " 100 " |
| No. 17 | " 18 | | | " | 24 | " | 18 | 66 | 44 | .30 " 100 " |
| No. 19 | Gauge | | | | | | 120 | 46 | - 44 | No Extra |
| No. 19 | " | 44 | " | Over | 120 | 66 | 144 | 46 | 44 | .20 per 100 pounds |
| No. 19 | " | 44 | " | Under | | | | 44 | 44 | .20 " 100 " |
| No. 19 | 44 | 66 | ** | " | | | 18 | 66 | 44 | .40 " 100 " |

Odd-size sheets in less than 4.000 pounds to the size will be subject to 10 cents per 100 pounds extra. Each quality of black or galvanized sheets ordered in less than 25 bundles 10 cents per 100 pounds extra.



SHEET STEEL



U. S. Gauge the Standard

SOFT SHEET STEEL, BLUE ANNEALED

| | | | | | _ | | | |
|---------------------------|-------|-----|-----|-----|-----|-----|-----|-----|
| Gauge Number | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| Price, per 100 lbs. extra | Rates | .10 | .10 | .20 | .20 | .30 | .30 | .40 |

BOX ANNEALED SHEET STEEL, ONE-PASS COLD ROLLED

| | ==== | | | | | === | | | |
|---------------------------------------|--------|----|----|----|----|-----|--------|----|----|
| Gauge Number | 18to21 | 22 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| · · · · · · · · · · · · · · · · · · · | 1 | | | | | l | 1 | | 1 |
| Price, per 100 lbs. extra | Rates | 10 | 10 | 20 | 20 | 30 | 40 | 60 | 70 |
| | | | | 0 | | | 1 . 20 | 1 | |

The above classification applies to standard sizes, which are as follows:

BLUE ANNEALED. No. 16 AND HEAVIER

Widths, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, and 48 inches. Lengths, 72, 84, 96, 108, 120, and 144 inches.

BOX ANNEALED, ONE-PASS COLD ROLLED, No. 10 AND LIGHTER

Widths, 24, 26, 28, 30, and 36 inches.

Lengths, 72, 84, 96, and 120 inches.

Gauges Nos. 24, 26, 27, and 28. Above widths, by 101 inches long.

ADDITIONAL TO LIST ON EXTRA SIZES. WIDTHS AND LENGTHS Extras per 100 Pounds

| Number 19 to 21 Gauge, inclusive. Over 32 in., not wider than 36 in " 36 in. to 40 in. wide, inclusive. " 40 in. to 44 in. " " 44 in. to 48 in. " Number 22 to 24 Gauge, inclusive. Over 32 in., not wider than 36 in " 36 in. to 40 in. wide, inclusive. | .10 .15 .20 .30 | Number 25 and 26 Gauge, inclusive. Over 32 in., not wider than 36 in " 36 in. to 40 in wide, inclusive. Number 27 and 28 Gauge, " Over 32 in., not wider than 36 in " 36 in. to 40 in. wide, inclusive Number 29 and 30 gauge, inclusive Over 32 in., not wider than 36 in | .10 .30 .10 .40 |
|---|--------------------------|--|--------------------------|
| " 40 in. to 44 " " " | .40 | · | |
| | Ler | ngths | |

| | | - | war and the second seco | |
|------------------------------------|-----|----|--|-----|
| Over 120 in. to 144 in., inclusive | . 1 | 10 | Under 60 in, down to 30 in | .10 |

Special sizes of less than 4000 pounds, 10 cents per 100 pounds for each item.

GALVANIZED SHEETS



Fig. 3284A

Our Galvanized Sheets are uniform in quality and finish, and we guarantee each and every sheet to be first-class, soft, smooth, level, and free from defects.

| Gauge No | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 27 | 28 | 30 |
|------------------------------|------------------------|-------------|-------------|------------------------------|------------------------------|-------------|------------------------------|-------------|-------------|------------|-------------|-------------|
| Weight per sq. ftoz. " "lbs. | $92\frac{1}{2}$ 5.78 | 72½ 4.53 | 52½ 3.28 | $\frac{42\frac{1}{2}}{2.65}$ | $\frac{34\frac{1}{2}}{2.15}$ | 26½ 1.65 | $\frac{22\frac{1}{2}}{1.40}$ | 18½ 1.15 | 14½ .906 | 13½ 843 | 12½ .781 | 10½ .656 |
| Priceper lb. | .12 | .12 | .12 | .12 | .13 | .13 | .14 | .14 | .15 | .16 | .17 | .21 |

NET EXTRAS

| No. | 18. | and | Heavier, | Over | 32 | to | 36 | inches | | | | - | | | |
|-----|------|------|-----------|--------|-----|----|----|--------|------|------|-------|---|--------|---------|--------|
| | | | Lighter | | | | | 44 | | | | | pe | r pound | .001ե |
| " | 19, | " | Less that | n | 24 | " | 12 | " | | | | | | 7.6 | .001/4 |
| Any | / Gi | auge | , Longer | than | 120 | in | ch | es | | | · | | | " | .0016 |
| " | | | less tha | n 60 t | o 3 | 0 | " | | | | | | | 16 | .001 ե |

APOLLO BEST BLOOM GALVANIZED SHEETS

Table of Weights of Sheets and Bundles (Without Bands) and Number of Sheets in One Bundle

| Gauge | | 10 | | 12 | | | 14 | | | | | | |
|---|---|--|---|---|--|---|---|---|---|---|---|---|--|
| Size of Sheets, Inches | Weight of Sheets, Pounds | Sheets in Bundle | Weight of Bundles. Pounds | Weight of Sheets, Pounds | Sheets in Bundle | Weight of Bundles, Pounds | Weight of Sheets, Pounds | Sheets in Bundle | Weight of Bundles, Pounds | Weight of Sheets. Pounds | Sheets in Bundle | Weight of Bundles, Pounds | Square feet, Per Sheet |
| 24 x 96 26 x 96 28 x 96 | 92.50 100.19 107.88 | 2 2 2 | 185 200 216 | 72.50 78.53 84.55 | 2 2 2 | 145 157 169 | 52.50 56.86 61.23 | 3 3 | 157 171 184 | 42.50 46.03 49.57 | 3 3 | 170 138 149 | 16 17.33 18.66 |
| 30 x 96 36 x 96 24 x 120 26 x 120 | 115.62 138.75 115.62 125.22 | $egin{bmatrix} 2 \\ 1 \\ 2 \\ 1 \end{bmatrix}$ | 231 139 231 125 | 90.62 108.75 90.62 98.15 | $\begin{bmatrix} 2\\1\\2\\2 \end{bmatrix}$ | 181 109 181 196 | 65.62 78.75 65.62 71.07 | $\begin{bmatrix} 2\\2\\2\\2 \end{bmatrix}$ | 131 157 131 142 | 53.12 63.75 53.12 57,53 | 3 3 3 | 159 127 159 173 | 20 24 20 21.66 |
| 28 x 120 30 x 120 36 x 120 | 134.88 144.53 173.44 | 1 1 1 1 | 135 145 173 | 105.71 113.28 135.94 | $\begin{bmatrix} 2\\1\\1 \end{bmatrix}$ | 211 113 136 | 76.55 82.03 98.44 | $\begin{bmatrix} \frac{1}{2} \\ 2 \\ 2 \end{bmatrix}$ | 153 164 197 | 61.97 66.41 79.69 | 3 2 2 | 186 133 159 | 23.33 25 30 |
| Gauge | | 18 | | | 20 | | | 22 | | | 24 | | |
| 24 x 96 26 x 96 28 x 96 30 x 96 36 x 96 24 x 120 26 x 120 28 x 120 30 x 120 | 34.50 37.37 40.24 43.12 51.75 43.12 46.70 50.31 53.91 | 4 4 4 4 3 3 3 3 | 138 149 161 172 155 129 140 151 162 | 26.50 28.70 30.91 33.12 39.75 33.12 35.87 38.64 41.41 | 6 5 5 4 5 4 4 4 4 | 159 143 155 166 159 166 143 155 166 | 22.50 24.37 26.24 28.12 33.75 28.12 30.46 32.81 35,16 | 7 6 6 5 5 5 5 4 | 157 146 157 141 169 141 152 164 141 | 18.50 20.04 21.58 23.12 27.75 23.12 25.04 26.98 28.91 | 8 8 7 7 6 7 6 6 5 | 148 160 151 162 166 162 150 162 145 | 16 17.33 18.66 20 24 20 21.66 23.33 25 |
| 36 x 120 | 64.69 | 2 | 129 | 49.69 | 3 | 149 | 42.19 | 4 | 169 | 34.69 | 5 | 173 | 30 |

IRON AND STEEL

WEIGHTS OF ROUND AND SQUARE IRON AND STEEL

PER LINEAL FOOT

| Size | Ro | UND | Squ | ARE | Size | Ro | UND | Squ | ARE |
|--|----------------|-----------------|----------------|-----------------|----------|----------------|-----------------|----------------|-----------------|
| Inches | lron Pounds | Steel Pounds | iron Pounds | Steel Pounds | Inches | Iron Pounds | Steel Pounds | Iron Pounds | Steel Pounds |
| 14 | .164 | .170 | .208 | .210 | 21/2 | 16.36 | 16.68 | 20.83 | 21.20 |
| 576 | .256 | .260 | .326 | .330 | 25% | 18.04 | 18.39 | 22.97 | 23.50 |
| 516 3 8 | .368 | .380 | .469 | .480 | 23/4 | 19.80 | 20.18 | 25.21 | 25.70 |
| 7/6 | .501 | .510 | .638 | .650 | 27/8 | 21.64 | 22.06 | 27.55 | 28.20 |
| 1/2 | .654 | .670 | .833 | .850 | 1 3 | 23.56 | 24.10 | 30.00 | 30.60 |
| 976 | .828 | .850 | 1.055 | 1.080 | 31/8 | 25.57 | 26.12 | 32.55 | 33.13 |
| 7/8 1/2 9/16 5/8 11/6 3/4 13/16 13/16 | 1.023 | 1.040 | 1.302 | 1.330 | 31/4 | 27.65 | 28.30 | 35.21 | 35.96 |
| 11/16 | 1.237 | 1.270 | 1.576 | 1.610 | 33/8 | 29.82 | 30.45 | 37.97 | 38.64 |
| 3/4 | 1.473 | 1.500 | 1.875 | 1.920 | 31/6 | 32.07 | 32.70 | 40.83 | 41.60 |
| 137 | 1.728 | 1.760 | 2.201 | 2.240 | 35 6 | 34.40 | 35.20 | 43.80 | 44.57 |
| 7.8 | 2.004 | 2.040 | 2.552 | 2.600 | 334 | 36.82 | 37.54 | 46.88 | 47.80 |
| 13/16 | 2.301 | 2.350 | 2.930 | 3.060 | 4 | 41.89 | 42.72 | 53.33 | 54.40 |
| 1 | 2.618 | 2.650 | 3.333 | 3.400 | 41/4 | 47.29 | 48.30 | 60.21 | 61.40 |
| 11/8 | 3.313 | 3.380 | 4.219 | 4.300 | 41/2 | 53.01 | 54.60 | 67.50 | 68.90 |
| 11/4 | 4.091 | 4.170 | 5.208 | 5.310 | 43/4 | 59.07 | 60.30 | 75.21 | 76.70 |
| 13_{8} | 4.950 | 5.050 | 6.302 | 6.430 | 5 | 6 5.45 | 66.80 | 83.33 | 85.00 |
| 11/2 | 5,890 | 6.010 | 7.500 | 7.650 | 51/4 | 72.16 | 73.60 | 91.88 | 93.70 |
| $1\frac{5}{8}$ | 6.913 | 7.050 | 8.802 | 8.980 | 51/2 | 79.19 | 80.80 | 100.80 | 102.80 |
| 134 | 8.018 | 8.180 | 10.210 | 10.400 | $5^{3}4$ | 86.56 | 88.30 | 110.20 | 112.40 |
| 178 | 9.204 | 9.380 | 11.720 | 11.900 | 6 | 94.25 | 96.10 | 120.00 | 122.40 |
| 2 | 10.470 | 10.710 | 13.330 | 13.600 | 614 | 102.30 | 104.30 | 130.20 | 132.80 |
| $2\frac{1}{8}$ | 11.820 | 12.050 | 15.050 | 15.400 | 61/2 | 110.60 | 112.80 | 140.80 | 143.60 |
| $2i_{4}^{\circ}$ | 13.250 | 13.600 | 16.880 | 17.200 | 7 | 128.30 | 130.90 | 163.30 | 166.60 |
| $23\frac{7}{8}$ | 14.770 | 15.100 | 18.800 | 19.200 | | | | | |

WEIGHTS OF FLAT IRON

| | | | | PEI | R LINE | L F00 | r in Po | UNDS | | | | |
|-------------------|------|------|------|----------|--------|--------|-------------|-------|-------|-------|-------|-------|
| Width | | | | | | THICKN | ESS INCI | HES | | | | |
| Inches | 1/8 | 3/6_ | 1/4 | <u>%</u> | 3/8 | 1/2 | <u>5</u> /8 | 3/4 | _ 1 | 11/4 | 11/2 | 2 |
| 1 | .42 | .63 | .83 | 1.04 | 1.25 | 1.67 | 2.08 | 2.50 | 3.33 | 4.17 | 5.00 | 6.67 |
| 1', 8 | .47 | .70 | .94 | 1.17 | 1.41 | 1.87 | 2.34 | 2.81 | 3.75 | 4.69 | 5.63 | 7.50 |
| $1^{1}{1}$ | .52 | .78 | 1.04 | 1.30 | 1.56 | 2.08 | 2.60 | 3.13 | 4.17 | 5.21 | 6.25 | 8.33 |
| 1^{3} 8 | .57 | .86 | 1.15 | 1.43 | 1.72 | 2.29 | 2.86 | 3.44 | 4.58 | 5.73 | 6.88 | 9.17 |
| 1^{1}_{2} | .63 | .94 | 1.25 | 1.56 | 1.88 | 2.50 | 3.13 | 3.75 | 5.00 | 6.25 | 7.50 | 10.00 |
| $\frac{1^{1}}{5}$ | .68 | 1.02 | 1.36 | 1.69 | 2.03 | 2.71 | 3.30 | 4.06 | 5.42 | 6.77 | 8.13 | 10.83 |
| 1^{3} 4 | .73 | 1.09 | 1.46 | 1.82 | 2.19 | 2.92 | 3.65 | 4.38 | 5.83 | 7.29 | 8.75 | 11.67 |
| 2 | .83 | 1.25 | 1.67 | 2.08 | 2.50 | 3.33 | 4.17 | 5.00 | 6.67 | 8.33 | 10.00 | 13.33 |
| $2^{1}\hat{4}$ | .94 | 1.41 | 1.88 | 2.34 | 2.81 | 3.75 | 4.65 | 5.63 | 7.50 | 9.38 | 11.25 | 15.00 |
| $2^{\frac{1}{2}}$ | 1.04 | 1.56 | 2.08 | 2.60 | 3.13 | 4.17 | 5.21 | 6.25 | 8.33 | 10.42 | 12.50 | 16.67 |
| 2 1,1 | 1.15 | 1.72 | 2.29 | 2.86 | 3.44 | 4.58 | 5.73 | 6.88 | 9.17 | 11.46 | | 18.33 |
| 3 | 1.25 | 1.88 | 2.50 | 3.13 | 3.75 | 5.00 | 6.25 | 7.50 | 10.00 | 12.50 | 15.00 | 20.00 |
| $3!_{4}$ | 1.35 | 2.03 | 2.71 | 3.39 | 4.06 | 5.42 | 6.77 | 8.13 | 10.83 | 13.54 | | 21.67 |
| $3 lac{1}{2}$ | 1.46 | 2.19 | 2.92 | 3.65 | 4.38 | 5.83 | 7.29 | 8.75 | 11.67 | 14.58 | 17.50 | 23.33 |
| 334 | 1.56 | 2.34 | 3.13 | 3.91 | 4.69 | 6.25 | 7.81 | 9.38 | 12.50 | 15.63 | 18.75 | 25.00 |
| 4 | 1.67 | 2.50 | 3.33 | 4.17 | 5.00 | 6.67 | 8.33 | 10.00 | 13.33 | 16.67 | 20.00 | 26.67 |
| $\frac{41}{2}$ | 1.88 | 2.81 | 3.75 | 4.69 | 5.63 | 7.50 | 9.38 | 11.25 | 15.00 | 18.75 | 22.50 | 30.00 |
| 5 | 2.08 | 3.13 | 4.17 | 5.21 | 6.25 | 8.33 | 10.42 | 12.50 | 16.07 | 20.83 | 25.00 | 33.33 |
| $5\frac{1}{2}$ | 2.29 | 3.44 | 4.58 | 5.73 | 6.88 | 9.17 | 11.46 | 13.75 | 18.33 | 22.92 | 27.50 | 36.67 |
| 6 | 2.50 | 3.75 | 5.00 | 6.25 | 7.50 | 10.00 | 12.50 | 15.00 | 20.00 | 25.00 | 30.00 | 40.00 |
| 7 | 2.92 | 4.38 | 5.83 | 7.29 | 8.75 | 11.67 | 14.58 | 17.50 | | 29.17 | 35.00 | 46.67 |
| 8 | 3.33 | 5.00 | 6.67 | 8.33 | 10.00 | 13.33 | 16.67 | 20.00 | 26.67 | 33.33 | 40.00 | 53.33 |

WEIGHT OF FLAT ROLLED STEEL BARS

PER LINEAL FOOT

| Width | | | | Тні | CKNESS, | Inche | s | · | | |
|---|--|--|--|--|------------------------------|--|--|--|--|--|
| Inches | 1/6 | 1.8 | 316 | 1/4 | 5/16 | 3/8 | 7/6 | 1/2 | 58 | 34 |
| 1 /2 5 /8 3 /4 7 /8 | .1060 .1381 .1594 .1859 | .2125 .2656 .3188 .3720 | .319 .399 .478 .558 | .425 .531 .636 .743 | . 364 . 797 | .957 | .929 1.116 | .850 1.06 1.275 1.487 | 1.33 1.594 | $egin{array}{c} 1.28 \\ 1.60 \\ 1.913 \\ 2.232 \\ \end{array}$ |
| 1 11/8 11/4 13/8 11/2 15/8 13/4 | .212 .2391 .2656 .292 .319 .346 .372 | .425 .4782 .5312 .585 .638 .692 .744 | .638 .717 .797 .875 .957 1.04 1.11 | .850 .959 1.06 1.17 1.28 1.38 1.49 | | 1.28 1.43 1.59 1.76 1.92 2.08 2.23 | 1.49 1.68 1.86 2.05 2.23 2.42 2.60 | 1.70 1.92 2.12 2.34 2.55 2.77 2.98 | 2.12 2.39 2.65 2.92 3.19 3.46 3.72 | 2.55 2.87 3.19 3.51 3.83 4.15 4.47 |
| 2 2½ 2½ 2¾ 2¾ | .425 .478 .531 .585 | .850 .96 1.06 1.17 | 1.28 1.44 1.59 1.75 | 1.70 1.91 2.12 2.34 | 2.12 2.39 2.65 2.92 | 2.55 2.87 3.19 3.51 | 2.98 3.35 3.72 4.09 | 3.40 3.83 4.25 4.67 | 4.25 4.78 5.31 5.84 | 5.10 5.75 6.38 7.02 |
| 3 3½ 3½ 3¾ | .638 .691 .745 .80 | 1.28 1.38 1.49 1.59 | 1.91 2.07 2.23 2.39 | 2.55 2.76 2.98 3.19 | 3.19 3.45 3.72 3.99 | 3.83 4.15 4.47 4.78 | 4.46 4.83 5.20 5.58 | 5.10 5.53 5.95 6.38 | 6.38 6.91 7.44 7.97 | 7.65 8.29 8.93 9.57 |
| 4 414 412 434 | .85 .90 .96 1.01 | 1.70 1.81 1.91 2.02 | 2.55 2.71 2.87 3.03 | 3.40 3.61 3.83 4.04 | 4.25 4.52 4.78 5.05 | 5.10 5.42 5.74 6.06 | 5.95 6.32 6.70 7.07 | 6.80 7.22 7.65 8.08 | 8.50 9.03 9.57 10.10 | 10.20 10.84 11.48 12.12 |
| 5 5½ 5½ 5¾ | 1.06 1.116 1.169 1.222 | 2.13 2.232 2.338 2.444 | 3.19 3.35 3.51 3.67 | 4.25 4.46 4.67 4.89 | 5.31 5.58 5.84 6.11 | 6.38 6.69 7.02 7.34 | 7.44 7.81 8.18 8.56 | 9.35 | 10.63 11.16 11.69 12.22 | 12.75 13.39 14.03 14.67 |
| 6 6¼ 6½ 6¾ | 1.275 1.328 1.382 1.434 | 2.550 2.656 2.765 2.869 | 3.83 3.99 4.14 4.30 | 5.10 5.31 5.53 5.74 | 6.38 6.64 6.90 7.17 | 7.65 7.97 8.29 8.61 | $9.29 \\ 9.67$ | 10.20 10.63 11.05 11.48 | 12.75 13.28 13.81 14.34 | 15.30 15.94 16.58 17.22 |
| 7 7½ | 1.487 1.594 | $2.975 \\ 3.188$ | 4.46 4.78 | 5.95 6.36 | 7.44 7.97 | 8.93 9.57 | 10.41 11.16 | $11.90 \\ 12.75$ | 14.87 15.94 | 17.85 19.13 |
| 8 8½ | 1.70 1.806 | 3.40 3.612 | $5.10 \\ 5.42$ | $\frac{6.80}{7.22}$ | 8.50 9.03 | 10.20 10.84 | 11.90 12.64 | 13.60 14.44 | 17.00 18.06 | 20.40 21.68 |
| 9 9½ | 1.913 2.019 | 3.826 4.037 | 5.74 6.06 | 7.65 8.08 | $9.56 \\ 10.10$ | $11.48 \\ 12.12$ | 13.40 14.14 | 15.30 16.16 | 19.13 20.19 | 22.96 24.23 |
| 10 11 12 | 2.125 2.335 2.55 | 4.25 4.676 5.10 | 6.38 7.02 7.65 | 9.34 | 10.62 11.68 12.75 | | $14.88 \\ 16.36 \\ 17.85$ | 17.00 18.70 20.40 | 21.25 23.38 25.50 | $\begin{array}{c} 25.50 \\ 28.05 \\ 30.60 \end{array}$ |

WEIGHT OF FLAT ROLLED STEEL BARS

PER LINEAL FOOT

| th, | | | | | THICKN | ess, inch | ES | | | |
|--|--|---|---|--|--|---|--|--|--|---|
| Width, Inches | 7/8 | 1 | 118 | 114 | 13/8 | 112 | 15/8 | 134 | 178 | 2 |
| 1 11/8 11/4 13/8 11/2 15/8 13/4 | 2.98 3.35 3.72 4.09 4.47 4.84 5.20 | | 3.83 4.3 4.78 5.26 5.74 6.22 6.70 | 4.25 4.79 5.31 5.85 6.38 6.91 7.44 | 4.67 5.26 5.84 6.43 7.02 7.60 8.18 | 5.1 5.74 6.38 7.02 7.65 8.29 8.93 | 5.52 6.22 6.90 7.60 8.29 8.98 9.67 | 5.95 6.7 7.44 8.19 8.93 9.67 10.42 | 6.38 7.17 7.97 8.77 9.57 10.36 11.15 | 6.80 7.65 8.50 9.33 10.20 11.05 11.90 |
| $2 \\ 2^{1}\cancel{4} \\ 2^{1}\cancel{5} \\ 2^{3}\cancel{4}$ | 5.95 6.69 7.44 8.18 | 6.80 7.65 8.50 9.35 | 7.65 8.61 9.57 10.52 | 8.50 9.57 10.63 11.69 | 9.35 10.52 11.69 12.85 | 10.20 11.48 12.75 14.03 | 11.05 12.43 13.81 15.19 | 11.90 13.40 14.88 16.37 | 12.75 14.34 15.94 17.53 | 13.60 15.30 17.00 18.70 |
| $\frac{3}{3_{14}^{14}}$ $\frac{3_{12}^{14}}{3_{14}^{3}}$ | 8.93 9.67 10.41 11.16 | 10.20 11.05 11.90 12.75 | 11.48 12.43 13.39 14.34 | 12.75 13.81 14.87 15.94 | 14.03 15.20 16.36 17.53 | 15.30 16.58 17.85 19.13 | 16.58 17.96 19.34 20.72 | 17.85 19.34 20.83 22.32 | 19.13 20.72 22.31 23.91 | 20.40 22.10 23.80 25.50 |
| 4 4 ¹ / ₄ 4 ¹ / ₂ 4 ³ / ₄ | 11.90 12.65 13.39 14.13 | 13.60 14.45 15.30 16.15 | 15.30 16.26 17.22 18.17 | 17.00 18.06 19.13 20.19 | 18.70 19.87 21.04 22.21 | 20.40 21.68 22.95 24.23 | 22.10 23.48 24.87 26.25 | 23.80 25.29 26.78 28.27 | 25.50 27.10 28.69 30.28 | 27.20 28.90 30.60 32.30 |
| 5 51 ₄ 51 ₂ 53 ₄ | 14.87 15.62 16.36 17.10 | 17.00 17.85 18.70 19.55 | 19.13 20.08 21.04 21.99 | 21.25 22.32 23.38 24.44 | 23.38 24.54 25.71 26.88 | 25.50 26.78 28.05 29.33 | 27.63 29.01 30.39 31.77 | 29.75 31.24 32.73 34.22 | 31.87 33.47 35.06 36.65 | 34.00 35.70 37.40 39.10 |
| $6 \\ 6^{14} \\ 6^{12} \\ 6^{3} \\ 4$ | 17.85 18.60 19.34 20.08 | $\begin{array}{c} 20.40 \\ 21.25 \\ 22.10 \\ 22.95 \end{array}$ | 22.95 23.91 24.87 25.82 | 25.50 26.56 27.62 28.69 | 28.05 29.22 30.39 31.56 | 30.60 31.88 33.15 34.43 | 33,15 34,53 35,91 37,99 | 35.70 37.19 38.68 40.17 | 38.25 39.85 41.44 43.03 | 40.80 42.50 44.20 45.90 |
| 7 7½ | 20.83 22.32 | $23.80 \\ 25.50$ | 26.78 28.68 | $\frac{29.75}{31.88}$ | 32.72 35.06 | 35.70 38.26 | 38.67 41.44 | 41.65 44.63 | 44.63 47.82 | 47.60 51.00 |
| 8 8½ | 23.80 25.30 | 27.20 28.90 | $\frac{30.60}{32.52}$ | 34.00 36.12 | 37.40 39.74 | $\frac{40.80}{43.35}$ | 44.20 46.96 | 47.60 50.58 | 51.00 54.20 | 54.40 57.80 |
| 9 9½ | $26.78 \\ 28.26$ | $\frac{30.60}{32.20}$ | $\frac{34.43}{36.34}$ | $\frac{38.26}{40.37}$ | 42.08 44.41 | $\frac{45,90}{48,45}$ | 49.73 52.49 | 53.56 56.53 | 57.38 60.56 | 61.20 64.60 |
| 10 11 12 | 29.75 32.72 35.70 | 34.00 37.40 40.80 | 38.25 42.08 45.90 | $42.50 \\ 46.76 \\ 51.00$ | $46.75 \\ 51.42 \\ 56.10$ | $51.00 \\ 56.10 \\ 61.20$ | 55.25 60.78 66.30 | 59,59 65,45 71,40 | 63.75 70.12 76.50 | 68.00 74.80 81.60 |

WEIGHTS AND DIMENSIONS OF

STANDARD STEEL "I" BEAMS AND CHANNELS

| Depth of Beam, In. | Weight per Foot Pounds | Area of Section Square Inches | Thickness of Web Inches | Width of Flange Inches | Depth of Beam, In. | Weight per Foot Pounds | Area of Section Square Inches | Thickness of Web Inches | Width of Flange Inches |
|-----------------------|------------------------------|--|-------------------------------|------------------------------|-----------------------|------------------------------|--|-------------------------------|------------------------------|
| 3 | 5.5 | 1.63 | .17 | 2.33 | 10 | 25.00 | 7.37 | .31 | 4.66 |
| 3 | 6.5 | 1.91 | .26 | 2.42 | 10 | 30.00 | 8.82 | .45 | 4.80 |
| 3 | 7.5 | 2.21 | .36 | 2.52 | 10 | 35.00 | 10.29 | .60 | 4.95 |
| 4 | 7.5 | 2.21 | .19 | 2.66 | 10 | 40.00 | 11.76 | .75 | 5.10 |
| 4 | 8.5 | 2.50 | .26 | 2.73 | 12 | 31.50 | 9.26 | .35 | 5.00 |
| 4 | 9.5 | 2.79 | .34 | 2.81 | 12 | 35.00 | 10.29 | .44 | 5.09 |
| 4 5 | 10.5 | 3.09 | .41 | 2.88 | 12 | 40.00 | 11.76 | .56 | 5.21 |
| 5 | 9.75 | 2.87 | .21 | 3.00 | 15 | 42.00 | 12.48 | .41 | 5.50 |
| 5 | 12.25 | 3.60 | .36 | 3.15 | 15 | 45.00 | 13.24 | .46 | 5.55 |
| 5 | 14.75 | 4.34 | .50 | 3.29 | 15 | 50.00 | 14.71 | .56 | 5.65 |
| 6 | 12.25 | 3.61 | .23 | 3.33 | 15 | 55.00 | 16:18 | .66 | 5.75 |
| 6 | 14.75 | 4.34 | .35 | 3.45 | 15 | 60.00 | 17.65 | .75 | 5.84 |
| 6 | 17.25 | 5.07 | .47 | 3.57 | 18 | 55.00 | 15.93 | .46 | 6.00 |
| 7 | 15.00 | 4.42 | .25 | 3.66 | 18 | 60.00 | 17.65 | .56 | 6.10 |
| 7 | 17.50 | 5.15 | .35 | 3.76 | 18 | 65.00 | 19.12 | .64 | 6.18 |
| 7 | 20.00 | 5.88 | . 46 | 3.87 | 18 | 70.00 | 20.59 | .72 | 6.26 |
| 8 | 18.00 | 5.33 | .27 | 4.00 | 20 | 65.00 | 19.08 | .50 | 6.25 |
| 8 | 20.50 | 5.96 | .35 | 4.08 | 20 | 70.00 | 20.59 | .58 | 6.33 |
| 8 | 23.00 | 6.69 | .44 | 4.17 | 20 | 75.00 | 22.06 | .65 | 6.40 |
| 8 | 25.50 | 7.43 | .53 | 4.26 | 24 | 80.00 | 23.32 | .50 | 7.00 |
| 9 | 21.00 | 6.31 | .29 | 4.33 | 24 | 85.00 | 25.00 | .57 | 7.07 |
| 9 | 25.00 | 7.35 | .41 | 4.45 | 24 | 90.00 | 26.47 | .63 | 7.13 |
| 9 | 30.00 | 8.82 | .57 | 4.61 | 24 | 95.00 | 27.94 | .69 | 7.19 |
| 9 | 35.00 | 10.29 | .73 | 4.77 | 24 | 100.00 | 29.41 | .75 | 7.25 |

WEIGHTS AND DIMENSIONS OF STANDARD CHANNELS

| Depth of Channel, In | Weight per Foot Pounds | Area of Section Square Inches | Thickness of Web Inches | Width of Flange Inches | Depth of Channel, In. | Weight per Foot Pounds | Area of Section Square Inches | Thickness of Web Inches | Width of Flange Inches |
|-------------------------|------------------------------|--|-------------------------------|------------------------------|--------------------------|------------------------------|--|-------------------------------|------------------------------|
| 3 | 4.00 | 1.19 | .17 | 1.410 | 8 | 21.25 | 6.25 | .58 | 2.62 |
| 3 | 5.00 | 1.47 | .26 | 1.504 | 9 | 13.25 | 3.89 | .23 | 2.43 |
| 3 | 6.00 | 1.76 | .36 | 1.602 | 9 | 15.00 | 4.41 | .29 | 2.49 |
| 4 | 5.25 | 1.55 | .18 | 1.580 | 9 | 20.00 | 5.88 | .45 | 2.65 |
| 4 | 6.25 | 1.84 | .25 | 1.652 | 9 | 25.00 | 7.35 | .61 | 2.81 |
| 4 | 7.25 | 2.13 | .33 | 1.725 | 10 | 15.00 | 4.46 | .24 | 2.60 |
| 5 | 6.50 | 1.95 | .19 | 1.750 | 10 | 20.00 | 5.88 | .38 | 2.74 |
| 5 | 9.00 | 2.65 | .33 | 1.890 | 10 | 25.00 | 7.35 | .53 | 2.89 |
| 5 | 11.50 | 3.38 | .48 | 2.037 | 10 | 30.00 | 8.82 | .68 | 3.04 |
| 6 | 8.00 | 2.38 | .20 | 1.920 | 10 | 35.00 | 10.29 | .82 | 3.18 |
| 6 | 10.50 | 3.09 | .32 | 2.038 | 12 | -20.50 | 6.03 | .28 | 2.94 |
| 6 | 13.00 | 3.82 | .44 | 2,160 | 12 | 25.00 | 7.35 | .39 | 3.05 |
| 6 | 15.50 | 4.56 | .56 | 2.283 | 12 | 30.00 | 8.82 | .51 | 3.17 |
| 7 | 9.75 | 2.85 | .21 | 2.090 | 12 | 35.00 | 10.29 | .64 | 3.30 |
| 7 | 12.25 | 3.60 | .32 | 2.198 | 12 | 40.00 | 11.76 | . 76 | 3.42 |
| 7 | 14.75 | 4.34 | . 42 | 2.303 | 15 | 33.00 | 9,90 | .40 | 3.40 |
| 7 | 17.25 | 5.07 | .53 | 2.408 | 15 | 35.00 | 10.29 | .43 | 3.43 |
| 7 | 19.75 | 5.81 | .63 | 2.513 | 15 | 40.00 | 11.76 | .52 | 3.52 |
| 8 | 11.25 | 3.35 | .22 | 2.260 | 15 | 45.00 | 13.24 | .62 | 3.62 |
| 8 | 13.75 | 4.04 | .31 | 2.347 | 15 | 50.00 | 14.71 | .72 | 3.72 |
| 8 | 16.25 | 4.78 | .40 | 2.439 | 15 | 55.00 | 16.18 | .82 | 3.82 |
| 8 | 18.75 | 5.51 | .49 | 2.530 | ا | | ١ | 1 | ٠ |

WEIGHTS AND DIMENSIONS OF

STANDARD STEEL TEES

| Size of Flange and Stem Inches | Thickness of Metal Flange and Stem Inches | Weight per Foot Pounds | Size of Flange and Stem Inches | Thickness of Metal Flange and Stem Inches | Weight per Foot Pounds |
|--|---|---|--------------------------------------|---|------------------------------|
| 1 1 11/4 | 1/8 to 5/2 3/6 " 3/2 3/4 " 1/4 | 1.00 1.30 1.70 | 2½ 2½ 3 | 5/6 to 3/8 3/8 " 7/6 5/4 " 3/6 | 5.60 6.50 6.80 |
| 114 114 | 716 373 1/4 373 54 373 16 373 | 2.10 2.00 2.60 | 3 3 | 3/8 " 7/8 3/8 " 1/6 7/6 " 1/2 | 7.90 9.00 10.10 |
| $\frac{1\frac{1}{2}}{1\frac{3}{4}}$ | 74 82 1/4 5/6 1/4 5/6 1/4 5/6 | 3.20 3.70 | 31/2 31/2 | 72 716 3/8 716 1/2 916 | 9.30 11.90 |
| $\begin{array}{c} 2 \\ 2_{14} \\ 2_{14} \end{array}$ | 5/16 " 3/8 1/4 " 5/6 5/16 " 3/8 | $egin{array}{c} 4.40 \ 4.20 \ 5.00 \end{array}$ | 4 | 3 8 " 716 1 2 " 916 | 10.90 13.90 |

EXTRAS ON "I" BEAMS AND CHANNELS

| | | | | EX | tras per 100 Pounds | |
|-----|---------|---------|--------------|-----------|---|-----|
| ĪB | eams an | d Char | nnels, 3 to | 15-inch | inclusive Base | |
| I | " 18 | , 20 an | d 24-inch. | | | |
| For | cutting | to me | asure with | less va | riation μ an + or $\frac{3}{2}$ -inch | |
| 44 | plain p | unchir | g one size | hole in | web only | |
| 44 | * " * | 46 | " | 44 | flange only | |
| 66 | " | 66 | 44 | 66 | both web and flange | |
| 46 | 46 | " | each ad | ditiona | l size hole | |
| 44 | assemb | ling in | to girders | . | | |
| " | coping, | , bevel | ling, fittin | g ends. | , including cutting to exact length, | |
| | with | or wit | thout punc | hing, a | lso including the riveting or bolting | |
| | of co | onnecti | on plates | or conn | ection angles | |
| 66 | paintin | g or oi | ling one co | oat with | ordinary paint or oil | |
| 66 | | | | | Shop Ra | tes |
| " | | | | | for ships or other purposes | |
| 66 | | | | | ned, such as angle connections, bolts | |
| | | | | | 1.55 | |

EXTRAS ON TEES, CHANNELS AND ANGLES Extras per 100 Pounds

| Tees | Channels | | | | | | |
|---|----------------------------------|---|---|--|--|--|--|
| 1½ to 3 x %-inch and heavier, but under 3-inch | Base .10 .20 .50 .60 | 1½ x ¾ - inch and heavier, but under 3-inch | Base .10 .20 .30 2.00 3.00 | | | | |

Tees 1 inch and larger, but smaller than 3-inch, ½-inch thick, 10 cents over the inch thick thic

For intermediate sizes, the next higher extra to be charged in all cases.

ANGLES

| 11% v 3%-inch, under 3 inches | Base 34 x 36-inch | . 1 30 |
|-------------------------------|---|--------|
| 1/2 1/16 men, under 5 menes | 10 5 - 17 4 | 43.00 |
| I to 1/4 x %-inch and neavier | $10 \parallel \frac{57}{8} \times \frac{1}{8} $ " | 2.00 |
| 7 x x % -inch | | 3 00 |
| 28 X Mg-IIICII | 40 52 A 58 | J 5.00 |

Angles 34 inch and larger but smaller than 3 x 18 inch thick, 10 cents extra over 36 inch extra.

Angles 3 x 3-inch by less than 1/4-inch thick; 50 cents extra.

All sizes

IRON CLASSIFICATION Adopted Jan. 3, 1896

Extras per 100 Pounds

ROUNDS AND SQUARES

| THE THE PARTY OF T | TD GGG/IIIEG |
|--|---|
| 2 " 2½" " | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ |
| FL | ATS |
| | |
| 1½ to 4 x 3/8 to 1 inch Base | 4½ to 6 x 1½ to 1½ inches |
| 178 178 X 7810 | |
| 1 " 1½6 x 3/8 " 7/8 "20 34 " ½6 x 3/8 " 3/4 "40 | 44 0 X 448 0 |
| 34 " 15/6 X 3/8 " 3/4 "40 | 1074 8 A 78 100 |
| 78 76 x 78 78 | 614 " 8 x 1 1/6 " 11/2 "60 614 " 8 x 1 5/8 " 2 "80 |
| | 6¼ " 8 x 2½ " 3 " 1.00 |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | 8½ " 10 x 3/8 " 1 "80 |
| 2 " 4 x 1 5 8 " 2 "50 2 " 4 x 2 1 8 " 3 "60 | 8½ " 10 x 1½ " 1½ "90 |
| 4½ " 6 x 3/8 " 1 "10 | 8½ " 10 x 15% " 2 " 1.00 |
| LIGHT | BANDS |
| | |
| 7 to 8 in. x No. 9 to 3/6 inch90 | ½6 to 76 in. x No. 9 to ¾6 inch |
| 7 8 X Nos. 10, 11 and 12 . 1.00 | 13/6 " 7/8 " x Nos. 10, 11 and 12 |
| 074 074 X No. 5 to 16 men10 | 116 " 34 " x No. 9 to 36 inch80 116 " 34 " x Nos. 10, 11 and 1290 |
| 074 074 x 1108. 10, 11 and 12 | 11/16 " 34 " x Nos. 10, 11 and 1290 11/16 " 5% " x No. 9 to 3/16 inch 1.00 |
| 4½ " 6 " x No. 9 to ½ inch50 4½ " 6 " x Nos. 10, 11 and 1260 | 9/6 " 5/8 " x No. 9 to 3/6 inch . 1.00 9/6 " 5/8 " x Nos. 10, 11 and 12 1.10 |
| 11/4 " 4 " x No. 9 to 3/6 inch40 | 1/ " 1/ " v No 0 to 3/ mob 1 20 |
| 11/4 " 4 " x Nos. 10, 11 and 1250 | 7/6 " 1/2 " x No. 9 to 3/6 inch 1.30 7/6 " 1/2 " x Nos. 10, 11 and 12 1.40 |
| 1 " 13/6 " x No. 9 to 3/6 inch50 | 3/8 x No. 9 to 3/6 inch |
| 1 " 13/6" x Nos. 10, 11 and 1260 | 3/8 x Nos. 10, 11, 12 and 1/8 1.60 |
| OVAL | |
| | |
| 7/8 to 1½ inch | 3/8 to 7/6 inch |
| 34 " 136 " | ½ " ½ x ¾ inch |
| 58 " 11 " | 78 76 X 78 INCH 1.20 |
| | HEAVY BANDS |
| HALF OVAL AND HALF ROUND | |
| 2½ to 3 inches | 8½ to 10 x¼ to ½ inch |
| | 1 0 X 4 /16 |
| 74 76 | 024 024 8 |
| 78 76 | $\begin{vmatrix} 4\frac{1}{4} & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & $ |
| 72 16 | 1 1/2 4 X /4 /16 |
| 3/8 " 7/6 " | 1 1/8 X /4 /16 |
| 5/16 inch 3.50 14 " 4.50 | 5/8 " 11/6 x 1/4 " 5/6 " |
| /4 | 1/2 " 9/6 x 1/4 " 5/6 " |
| Half oval less than 1/4 the width in | $\frac{3}{8}$ " $\frac{16}{7}$ x $\frac{14}{4}$ " $\frac{16}{16}$ " |
| thickness, extra price. Cutting to length, 10c per 100 lbs. extra. | Heavy Bands 7/32 inch thick, 10c per 100 |
| ouvering to length, for per 100 lbs. extra. | lbs. higher than 1/4 to 5/6 inch thick. |
| | |
| HUBEE | HOE IDON |

BEVEL EDGE BOX IRON

Same as Light Bands, same sizes.



2.60

IRON AND STEEL CLASSIFICATION

NORWAY AND SWEDISH IRON Adopted Jan. 3, 1896

| ROUNDS AND SQUARES—Extras Per 100 Pounds | |
|--|--|
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | .90 |
| FLATS | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | .20 .30 .50 .80 1.00 |
| | 120 |
| STANDARD STEEL CLASSIFICATION Adopted October 1, 1909 ROUNDS AND SQUARES—Extras per 100 Pounds | |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | .30 .40 .50 .75 1.00 1.25 |
| FLAT BARS AND HEAVY BANDS | |
| $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 1.20 2.00 .10 .20 .30 .40 |
| LIGHT BARS AND BANDS | |
| $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | 1.20 1.30 1.30 1.50 1.80 1.90 2.40 |
| OVALS | |
| 4 to 1½ inches30 | .60 |
| ½ inch | •••• |
| $\frac{7}{8}$ to $\frac{4}{1}$ in. x $\frac{7}{32}$ to $\frac{1}{2}$ in. .50 $\frac{5}{8}$ x $\frac{5}{32}$ and $\frac{3}{6}$ in. 1.00 $\frac{1}{2}$ x $\frac{1}{8}$ inch. $\frac{27}{4}$ x $\frac{5}{8}$ in. (special). .50 $\frac{9}{6}$ x $\frac{6}{4}$ in. 1.30 $\frac{7}{6}$ x $\frac{6}{4}$ " $\frac{3}{4}$ x $\frac{3}{6}$ " .80 $\frac{9}{6}$ in. x No. 13 1.80 $\frac{3}{8}$ x $\frac{3}{2}$ to $\frac{3}{2}$ inch. | 1.30 2.10 2.50 |
| HALF ROUNDS | |
| $\frac{1}{8}$ to 2 inches | 2.50 |

For intermediate sizes, next higher extra will be charged.



STANDARD STEEL CLASSIFICATION

Extras per 100 pounds

HEXAGONS

| 34 to 214 inches | .30 .50 | 1/2 to % inches | .70 1.10 | 3/8 inch | 1.30 1.50 |
|------------------|------------|-----------------|-------------|----------|--------------|

For intermediate sizes the next higher extra will be charged.

EXTRAS FOR CUTTINGSTEEL BARS TO SPECIFIED LENGTHS

| Hot sawing or shearing to lengths over 24 inches | 10 |
|--|-----|
| " " " " " 12 inches to 24 inches inclusive | .20 |
| Machine cutting to lengths over 24 inches | |
| " " " 12 inches to 24 inches inclusive | .40 |
| For machine cutting to lengths less than 12 inches, extra will be furnished on | |
| application, but will not be less than | .60 |
| Machine straightening | .20 |

Extra for machine straightening and centering will be furnished on application. No charge will be made for hot sawing or shearing to lengths of 5 feet and over.

OPEN HEARTH, ROUND AND SQUARE SPRING STEEL

| 5% | to | 11% | incl | h | Base | 5/6 inch | 1.00 |
|-----|----|------|------|---|------|--|------|
| 14 | 46 | % | " | | 1 00 | 17 4 | 1.50 |
| 3/8 | 66 | 7/16 | 66 | | .50 | 3½ " ··································· | 3.00 |

Spirals cut to length, 1/10 cent per pound extra.
""" and tapered, 3/10 cent per pound extra.

OPEN HEARTH, FLAT SPRING STEEL

| 11/4 to 4 inch x No. | 4 Ga. | . to ½ inch | B | ase |
|---|-------|-----------------------|-----------|------|
| 1 and 116 " x No. | 1 " | " No. 4 Ga | | .20 |
| 1 to 3 " x No. | 5 " | " No. 7 " | • • • • • | .50 |
| $\frac{3}{4}$ and $\frac{1}{16}$ " x No. | 1 " | " No. 7 " | | 00 |
| 38 " 16 " X No. | 1 " | " No. 7 " | ····· † | 00 |
| 34 to 3 " x No. 34 " 3 " x No. 34 " 3 " x No. | 11 " | " No. 10 " " No. 16 " | î | .50 |
| 3/ " 3 " x No. | 17 " | " No. 19 " | 4 | . 20 |
| 3 " 5 " x No. | io " | " No 16 " | 4 | E.UU |
| 38 " 58 " x No. 38 " 58 " x No. | 17 " | " No. 19 " | 5 | 00.0 |

Thinner than No. 19 gauge, refer to sheet list.

TOE CALK STEEL

| Resp. 5/ v 1/ to 1 inch inclusive | | |
|--|---|-----------------------------|
| 36 x ½ to ½ inches inclusive 2.00 36 x ½ to 1 inch < | Base 5/6 x 1/2 to 1 inch inclusive .5 | 50 75 75 00 .00 |

Put up in bundles of 100 pounds each.

HORSE SHOE STEEL

5% to 11% inch by 5% to 7% inch, 1.00 per 100 pounds extra.

PLOW STEEL

Cast, open hearth, and Bessemer, prices on application.



Base

TOOL STEEL CLASSIFICATION

Extras per Pound

ROUND, SQUARE, AND OCTAGON

| 5% to 2-inch Base 6 | 712 " | 0 " | ا معمالیت بیش | |
|---------------------|-------|--------|-----------------|------|
| | 178 | 8 " | .031/2 3/6 inch | .05 |
| 21% " 3 " | 916 " | 1/2" | .001/2 32 " | .10 |
| 11/8 " 5 "02 | 76 ", | ,,3/8" | .01 1/8 " | . 18 |

FLAT

| 5/8 to 2-inch thick x 9/6 | to 2-in | ch wide | | | . Base |
|--|---|--|--|---|--|
| 1/8 x 5/6-inch 1/8 x 1/4 " 1/8 x 5/6 " 1/8 x 5/6 " 1/8 x 7/6 to 1/2-inch 1/8 x 7/6 " 1/8 x 7/1/8 " 8 " 1/8 x 7/1/8 " 7 " " | .20 .15 .08 .04 .03 .02 .03 .05 .04 .03 .02 .01½ | 3/6 x 71/8 to 8 1/4 x 5/6 " 3/8 1/4 x 7/6 " 5/8 1/4 x 7/6 " 5/8 1/4 x 21/8 " 7 1/4 x 21/8 " 8 5/6 x 1/6 " 8 8/8 x 7/6 " 8 1/6 x 21/8 " 8 | inch02 "01½ "01½ "01½ "01 "02 "01½ "01 "01 "01 "01 "01 "01 "01 "01 | 17% " 2 x 71% " 8 21% " 3 x 21% " 5 21% " 3 x 51% " 8 | Base .01 .01 .01 .01 .01 .01 .01 .01 .01 .01 |

CUTTING TO SPECIFIED SINGLE AND MULTIPLE LENGTHS

| 24 inches or over | .00½ .01 | $\frac{12}{6}$ | to " | 18 12 | inche | es. | | ••• | ••• | .01½ .02 |
|-------------------|-------------|----------------|---------|----------|-------|-----|------|---------|---------|-------------|
| Annealing | | | | | | | | | | |

ENGLISH TOOL STEEL ROUND, SQUARE AND OCTAGON

| SQUARE | | | | | | | | | | |
|------------|-----------|---------------|-----|---------|-----|---------|-----|--|--|--|
| 1 g-inch19 | 5/32-inch | 11 3/6-inch | .06 | %2 inch | .03 | 14 inch | .02 | | | |

3 to 2-inch, inclusive.....

FLAT

| 3/8 x 1/8 " | .04 .01 .02 | 2½ x 15% in. and over. 2¾ x 1½ " " " 3 x 1¾ " " " | .01 .01 .01 | 4½x1 to 2-inch 4½x2¼ to 3¼-inch 5x ½ to 1¾-inch 5x2 "2½" | .02 .01 .02 |
|---------------|-------------------|---|-------------------|--|-------------------|
| 5% x 1/8 inch | .02 | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | .01 .01 .02 | $\begin{bmatrix} 6 \times \frac{3}{4} & 1 & 1 & 2 & 4 & \dots \\ 6 \times 1 & \frac{3}{4} & 2 & 2 & 2 & 4 & \dots \end{bmatrix}$ | .01 .02 |

| All widths 1 inch and under with thickness of $\frac{5}{16}$ inch or underper pound All widths over 1 inch with thickness of $\frac{3}{16}$ inch or under | .15 |
|---|-----|
| Squares, % square or smaller | .15 |
| Rounds, 5/16 diameter or smaller | .15 |

BRASS AND COPPER WIRE CLOTH

No Length Less than 100 Feet shall be Considered a Roll

| No. of Meshes per inch | | | | | | | | | | |
|------------------------|----------|----------|----------|------------------|----------|----------|----------|----------|-----------|------|
| Priceper square foot | 53 | .45 | .42 | 1.75 | 1.25 | .85 | .65 | .60 | .55 | .85 |
| No. of Meshes per inch | 50 35 | 50 36 | 60 35 | 60 3 6 | 60 37 | 70 37 | 80 38 | 90 39 | 100 40 | •••• |
| Priceper square foot | .65 | .58 | .88 | .70 | .60 | .80 | 1.00 | 1.25 | 1.45 | |

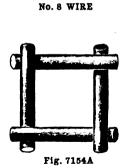
EXTRA FINE BRASS WIRE CLOTH

No Length Less than 100 Feet shall be Considered a Roll

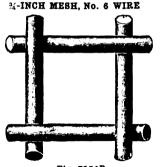
| No. of Meshes per inch | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 |
|----------------------------------|--------------|---------------------|---------------------|------|------|------|------|------|------|------|
| Plain per square foot Twilled | 1.50 1.60 | $\frac{1.75}{1.85}$ | $\frac{2.25}{2.35}$ | 2.55 | 3.00 | 3.60 | 4.20 | 4.80 | 5.40 | 6.00 |

REGULAR COAL SCREEN GRADE OF WIRE CLOTH

Iron or Steel



%-INCH MESH





14-INCH MESH

Fig. 7154B

Fig. 7154C

The mesh in Coal Screen Cloth is the space between the wires, while in all other wire cloth the mesh is measured on the centers of wires.

| Space between Wiresinches | $2\frac{1}{2}$ $2\frac{1}{2}$ | 134 | 11/2 | 134 | 1 | 34 | 5/8 | 1/2 | 3/8 | 1/4 |
|---|-------------------------------|-----|------------|-----------|------------------|---|-----|-----|-----|-----------|
| Size Rod, inches or No. Wire Price per square foot | 3/8 5/6 .75 .58 | 3 8 | 1/4 .61 | 14 .65 | $\frac{14}{.73}$ | $\begin{array}{c} 6 \\ .55 \end{array}$ | .48 | .40 | .40 | 13 .40 |

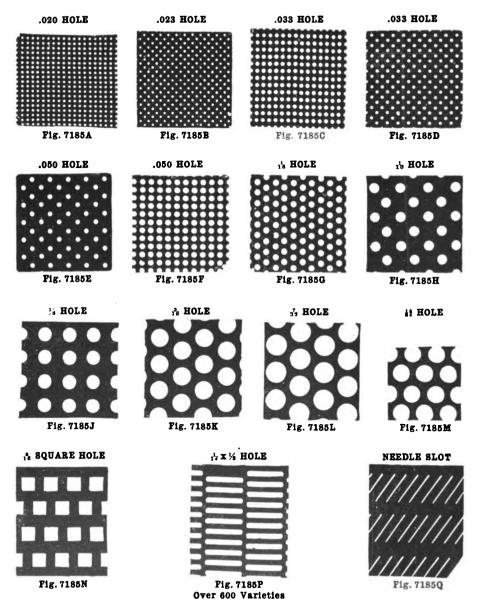
STANDARD SIZES IN YARD SCREENS FOR SCREENING THE DIFFERENT GRADES

| 1/4 | -inch | mesh | Screen | is used | for screening | pea coal. | | |
|--------------------------|-------|------|--------|---------|----------------|--------------|---------|------|
| 1/3 | ** | " | 44 | " | " | chestnut o | oal. | |
| $\frac{1}{3}\frac{2}{1}$ | ** | " | " | " | u | fine stove | | |
| 1 - | 44 | " | " | 46 | " | coarse | " | |
| 2 | " | ** | " | " | " | egg | " | |
| 21/3 | " | " | " | " | " | broken | u | |
| 5% | " | " | " | +6 | "takir | ig ashes fro | om cind | ers. |
| 5/8 3/8 | " | | " t | akes pe | a out of stove | | | |
| 11/3 | ** | ** | " | | estnut out of | | | |
| $21\overline{2}$ | " | " | 44 | | ove out of bro | | | |
| $\frac{1}{2}\frac{7}{2}$ | " | " | " | | | | | |

DO NOT CUT CATALOGUE. ORDER BY FIGURE NUMBER.

DESIGNS OF SCREENS IN PERFORATED METAL

Iron, Steel, Brass, Copper, Aluminum, Tin, Lead, and Other Sheet Metals
Perforated to Order



METAL BUILDING MATERIAL

HY-RIB SHEATHING



FIG. 6548A

Hy-Rib is a steel sheathing stiffened by rigid deep ribs. The ribs and lath are manufactured from a single sheet of steel making it a unit of lath and studs.

No centering is required in concrete construction as the ribs give sufficient strength and rigidity. In walls and partitions Hy-Rib does away with the use of studs. The lath surface is perfectly straight and true, and the expansion is such as to provide a perfect key with a minimum amount of plaster.

Uses for Hy-Rib are found in every field of building operation, in construction work of all kinds, floors, roofs, walls, partitions, ceilings and furring. curved Hy-Rib is used for arched floors, culverts, conduits, sewers, silos, tanks, reservoirs and tunnels.

| Types | Spacing of | Height of | Width of | Gauge No. | Stand. Lengths |
|--------------|-------------|------------------------|---------------|------------------------------|------------------------------------|
| | Ribs Inches | Ribs Inches | Sheets Inches | U. S. Stand. | Feet |
| 3 Rib 4 " | 7 3½ | 13/ 16 13/ 16 | 14 10½ | 24, 26 or 28 24, 26 or 28 | 6, 8, 10 and 12 6, 8, 10 and 12 |

RIB BARS



Fig. 6548B

Rib-bars are for reinforcing concrete. Specially rolled with a series of cross-ribs designed to secure maximum grip on concrete. Made from highest grade of open hearth steel with an elastic limit of 50,000 pounds per square inch. Great bending qualities.

| Sizeinches | 14 | 3 8 | 1/2 | $\frac{1}{5}$ | 3 4 | 78 | 1 | 118 | 114 |
|--|----|-----|-----|---------------|--------|----|---|---------------------|-----|
| Areasquare inches Weight per Footpounds | | | | | | | | $\frac{1.27}{4.38}$ | |

Any special grade of steel can be provided if order is large enough, and sufficient time is given to secure special rolling.

HIGH CARBON TWISTED STEEL BARS FOR REINFORCING CONCRETE



Fig. 6548C

Stocked in $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, 1 and 134-inch. Cut to required lengths.

CAREY'S FLEXIBLE CEMENT ROOFING THE CAREY ROOF STANDARD

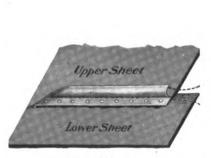




Fig. 4181B Fig 4181A A flexible layer of Carey's asphalt cement composition rolled under enormous pressure, between a woolen felt and a strong Calcutta burlap. An asphalt composition is imbedded into the meshes of the burlap, at the factory, which renders painting of the

roofing unnecessary at the time of application.

A feature, which is found exclusively in Carey's Flexible Cement Roofing is the Patent Lap Joint, arranged along one edge of the sheet, the burlap being extended to form the lap. After the sheets of roofing are joined and nailed securely together to roof boards this extension, or lap, is cemented securely over the nail heads in the manner as shown in the illustration, making a solid joint, absolutely water-tight and wind-proof, and protecting the nails so corrosion never takes place.

The cement composition, forming the body of Carey's roofing, is the result of a secret process. This composition cannot deteriorate in any way when subjected to ordinary exposure; heat up to 300 deg. Fahrenheit does not soften it, and cold does not make it

brittle, will stand a test of 350 deg. of heat and not melt.

Carey's Roofing will offer greater resistance than any other roofing to ammonia fumes, sulphurous gases, etc.

It carries the same rate of insurance as the heaviest grade of tar and gravel or slag

Packed in rolls containing 108 square feet; the width of the sheet being twenty-nine inches. This is sufficient to apply 100 square feet, allowing for all laps and joints, and is termed one square.



Fig. 4181C

With each roll is furnished one and one-half pounds of special large head rooting nails and one-half gallon of lap cement, which is sufficient to apply the roofing.

Full directions are printed on the wrapper of each roll so that no mistake can be made in the application. There is nothing complicated about applying Carey's Roofing; no skilled labor being required. The only tools required are a knife and hammer.

Shipping weight, per square, with all materials for application, is about 80 pounds.

For all classes of buildings where a durable, economical roof is required, from the lightest summer cottage to the heaviest mill or foundry. Flat or steep surfaces.

Carey's Roofing offers the greatest resistance to conditions to which roofs of paper mills, dry kilns, foundries and similar structures are subjected. Send us dimen sions of your building and we will submit you prices, samples, etc.

We are prepared to furnish paint and cement for

this roofing after it is applied.

We solicit your orders Prices on application.



CAMEROID READY ROOFINGS

SMOOTH SURFACE ROOFING

CROSS SECTION

Trinidad Lake Asphalt Trinidad Lake Asphalt

Fig. 3578A

Made in four weights, ½, 1, 2, and 3-ply. For ordinary purposes 2-ply is the most desirable, the 3-ply being best adapted for large roofs exposed to unusual weather conditions. Packed in rolls of 216 square feet, with the exception of the 3-ply, which is packed in rolls of 108 square feet.

| Price, | 1/2- | ply, | weight | 25 | pounds | | per roll | 2.00 |
|--------|------|------|--------|----|--------|---------------------------------------|----------|------|
| ." | Ĩ | 66 | aT . | 35 | - 66 | · · · · · · · · · · · · · · · · · · · | - 16 | 2.25 |
| 44 | 2 | " | 44 | 45 | " | | ** | 3.25 |
| ** | 3 | ** | 44 | 55 | " | | " | 4.00 |

MODEL ROOFING CROSS SECTION



Trinidad Lake Asphalt Burlap Trinidad Lake Asphalt

Fig. 3578B

The strongest and most durable ready roofing made. Composed of a combination of layers of heavy wool felt, burlap, and Trinidad Lake asphalt, thoroughly saturated and cemented together, with a surface of crushed quartz.

Price, in rolls of 112 square feet, weight 120 pounds...... per roll 4.50

STONE SURFACE ROOFING CROSS SECTION



Trinidad Lake Asphalt Wool Felt Trinidad Lake Asphalt Wool Felt

Fig. 3578C

A popular style of roofing. Surfaced with sea-beach gravel.

Price, in rolls of 112 square feet, weight 125 pounds..... per roll

3.50

WHITESTONE ROOFING CROSS SECTION



Crushed Stone Trinidad Lake Asphalt Wool Fel Trinidad Lake Asphalt

Fig. 3578D

Similar in appearance to the Model Roofing. Made in two weights, 1 and 2-plv.

| Price, 1-ply, in rolls of 112 square | feet, | weight 90 pou | ınds | per roll | 3.00 |
|--------------------------------------|-------|---------------|------|----------|------|
| " 2 " " " " 112 " " | " | " 105 | " | - " | 3.50 |

PERFECTED GRAVEL ROOFING

Similar to the Stone Surface Roofing, having in addition a coating of Trinidad Lake asphalt on the back, which makes it proof against moisture from within the building, caused by sweating or condensation.

Price in rolls of 112 square feet, weight 135 pounds...... per roll 4.25



ROOFING AND BUILDING PAPER

BUILDING PAPER



TARRED ROOPING FELT

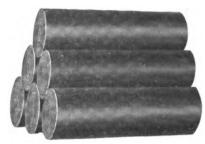


Fig. 9484B

RED ROSIN SIZED SHEATHING. ROLLS 36 INCHES WIDE

| Number, indicating Pounds per Roll | 20 30 35 |
|---|--------------|
| Price, Rolls of 500 Square Feetper roll | |

TARRED ROOFING FELT, 32 INCHES WIDE, 50 TO 60 LBS. PER ROLL

| Price, No. | 1, Weight | about 20 | lbs. p | er Square | | per pound. | |
|------------|-----------|----------|--------|-----------|-------------|------------|---|
| 66 66 6 | 0 11 | " 15 | 46 | •• | | - 46 | i |
| | 4, | 1., | | | | | |
| | | | | | | | |

THREADED TARRED FELT, 32 INCHES WIDE

| Number Square Feet in Roll | 250 | 500 |
|----------------------------|-----|-----|
| Weight, per Rollpounds | 23 | 45 |
| Priceper square | | |

DEADENING FELT, 14 LBS. PER SQUARE YARD

| Price, | 36 incl | ies wid | e, aboı | it 75 lbs | . per | Roll | per | pound | |
|--------|---------|---------|---------|-----------|-------|------|---------|-------|--|
| _ | | | | | - | | | | |

READY PREPARED ROOFING

| Thickness | 2 | 3 |
|---------------------------|---|---|
| Weight, per Square pounds | | |
| Priceper square | | |

Two-ply consists of two sheets of best quality tarred felt, cemented together with one layer of waterproof composition. Three-ply has three layers of felt. Rolls are 32 inches wide, 40^{4} ₂ feet long and contains 108 square feet.

BLUE PLASTER BOARD, 36 INCHES WIDE

| Vumbor Consor Post in Dall | 950 | 500 |
|-----------------------------|-----|-----|
| Number, Square Feet in Roll | 250 | 500 |
| Weight, per Rollpounds | 25 | 50 |
| Price per roll | | |

PAINTS, ETC. CAMEROID ROOF PAINTS



Fig. 2124A

| Style of Package | 5-Gal. Kegs | 10-Gal. Kegs | 1; Barrels | Barrels |
|------------------|-------------|--------------|--------------|-------------|
| Price per gallon | | | | |
| SMOKESTACK PAIN | T-DIXON | 'S GRAPI | HITE | |
| Style of Package | Barrels | 12 Barrels | 10-Gal. Cans | 5-Gal. Cans |
| Priceper gallon | | | | |
| sco-c | O PAINT | | | |
| Color | | Red | Black | Green |
| Price, Barrels | | | | |

Furnished also in 5-gallon kits and 1-gallon cans.

This is not a cheap paint of chalky, brittle composition, but different and better. Built on the wonderful basic compound, Beta-Pitch. Prepared by special process with the one end in view, long life. Made to stand heat, cold, acids, time, sun and snow. Will not peel, crack or blister. Used for factories, barns, bridges, fences, roofs, tanks, boilers, stacks, warehouses, depots, railroad cars, boats, trolley poles, etc. Satisfactorily used by U. S. Navy.

BLACK ASPHALTUM PAINT

| Style of Package | Barrels | 14 Barrets | 10-Gal. Cans | 5-Gal. Cans |
|------------------|---------|------------|--------------|-------------|
| Priceper gallon | | | | |

ROOFING BRUSHES



Fig. 2124B

ROOFING CAPS AND NAILS



Fig. 2124C

ROOFING BRUSHES

| | - | | | | - | _ | | | _ | - | : - | : : | | _ | _ | | | | - | _ | ···· | - | | | · |
|-------|---|-----|---|------|---|---|------|------|-------|---|-----|-----|------|---|---|------|---|------|---|---|------|---|---|------|---|
| Price | 2 | Kno | t | | | | | | | | | | | | | | | | | | | | | each | |
| 4. | 3 | • • | | | | | | | | | | | | | | | | | | | | | | 6 | |
| 44 | 4 | 44 | | | | | | | | | | | | | | | | | | | | | | 44 | |
| 46 | Ĥ | emp | | | | | | | | | | | | | | | | | | | | | | 4.4 | |
| | | | | _ | | | | | | | | | | | | | _ | | | | | - | - | | |

ROOFING CAPS AND NAILS

| · · · · · · · · · · · · · · · · · · · | |
|---|--|
| Price Tin Caps %4-inch Diameter per pound | |
| Frice In Caps %-inch Diameterper pound | |
| 4 Th 1 1 TTT' NT 11 41 41 4 1 1 | |
| " Barbed Wire Nails, 11/8 inches long " | |
| Date out () 10 I turney 17 g 12 ones 10 ng 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | |

Each roll roofing takes one pound each caps and nails.

ASBESTOS PROTECTED METAL ROOFING

METAL PROTECTED SHEETS

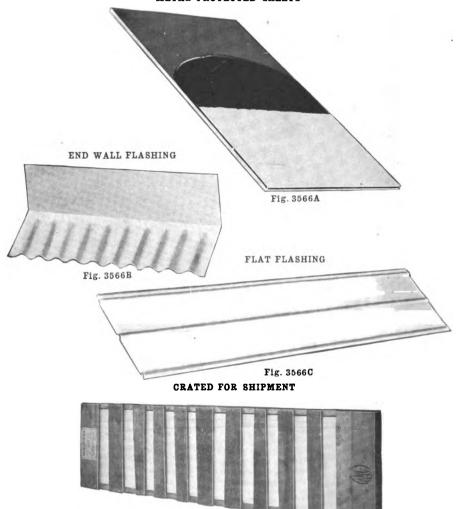


Fig. 3566D

Asbestos Protected Metal is applicable to a wide variety of service, as roofing, siding and interior sheathing, and for fire-proofing in buildings of all kinds. It overcomes all the defects so apparent in the various grades of other materials used for roofing and siding, and at the same time possesses certain unique characteristics which makes it superior to them all.

Among the uses of Asbestos Protected Metal are the following: Roofling and siding, railroad and manufacturing buildings, coal tipples, tobacco warehouses, farm buildings, bungalows, automobile garages, car barns, chemical plants and boiler houses, for steamboat service, fire-proof and permanent ceilings and wall finish.

CORRUGATED IRON ROOFING



Pig. 203A

WEIGHT OF CORRUGATED SHEETS PER SQUARE OF 100 SQUARE FEET

| Gauge | BLA | BLACK GALVANIZED | | NIZED | Gauge | Br. | ACK | GALVANIZED | | |
|--------|--------------------|--------------------|--------------------|---------------------------------|--------|--------------------|-------------------|-------------------|---------------------------------|--|
| Number | 214-inch Pounds | 114-inch Pounds | 214-inch Pounds | 1 ¹ 4-inch Pounds | Number | 212-inch Pounds | 14-inch Pounds | 24-inch Pounds | 11 ₄ -inch Pounds | |
| 20 | 167 | 170 | 184 | 187 | 25 | 97 | 99 | 115 | 117 | |
| 21 | 153 | 156 | 170 | 173 | 26 | 83 | 85 | 101 | 103 | |
| 22 | 139 | 142 | 156 | 159 | 27 | 76 | 78 | 94 | 96 | |
| 23 | 125 | 127 | 142 | 145 | 28. | 69 | 71 | 87 | 88 | |
| 24 | 111 | 113 | 128 | 131 | | | | | | |

Shows our Corrugated Roofing Sheets of 10 corrugations, each 21% inches wide by 1% inch high. The edge corrugations are 3% inch high instead of 1% inches. Regular length of sheets in stock, 5, 6, 7, 8, 9 and 10 feet. When lengths are not specified we always ship 8-foot sheets. All our Corrugated Sheets, of all gauges, have a uniform width. Full width is 26 inches; covering width is 24 inches.

All of our black Iron Roofing has one coat of paint on each side and will add 2 pounds per square to above weight. All Roofing is figured per square after corrugating, but before putting on roof.

Our regular stock of roofling has 2½-inch corrugations, but can furnish the 1¼-corrugations by ordering from the factory when so wanted.

V CRIMPED ROOPING

PRESSED STANDING SEAM ROOFING

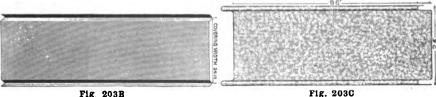


Fig 203B CURVED AWNING SHEETS

2½-inch Corrugations st

No. 203B regular length sheets in stock are 6, 7, 8, 9 and 10 feet, regular width is 2 feet from center to center of crimps.

No. 203C sheets as shipped 96 inches by 24 inches. Will cover 93½ by 24 inches.

ROLL RIDGE CAP

Fig. 203D

No. 203 D we are prepared to furnish Awning Brackets and Posts for Complete Awnings, and will be pleased to quote prices on receipt of specifications.

Prices on Iron Roofing quoted on application.

No. 203 E regular lengths, 8 feet.



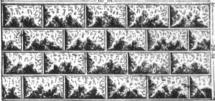
Descrip Gauge. Size ...

METAL SIDING, ETC.

PLAIN STEEL BRICK SIDING







Pig. 3279A

PLAIN STEEL BRICK AND ROCK FACED STONE SIDING

| TANK OF THE BUILDING AND HOOK TABLE OF | <u> </u> | |
|--|---------------|---------------|
| otion | Painted | Galvanized |
| number inches | 28 28 x 60 | 28 28 x 60 |

WEATHERBOARD SIDING







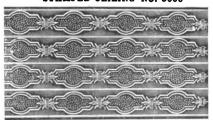
Pig. 3279C Fig. 3279D WEATHER-PROOF SIDING AND BEADED CEILING

| Description | Painted | Galvanized |
|-----------------------------|----------|------------|
| Gauge number | 28 | 28 |
| Lengthinches Covering width | 96 94 | 96 24 |

The Beads on the Beaded Ceiling are 3 inches center to center.

STAMPED CEILING NO. 3000

3/6-INCH CRIMPED GALVANIZED SHEETS



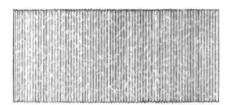


Fig. 3279E

Fig. 3279F

NO. 3000 STAMPED CEILING

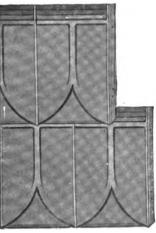
| Gaugenumber | 28 |
|---|---------|
| Length inches Covering width " | 24 |
| Price, Black Iron, sized both sidesper square | • • • • |

%-INCH CRIMPED GALVANIZED SHEETS

| Guage number | 28 | 27 | 28 | 27 |
|--------------|---------|---------|----------|----------|
| Sizesinches | 30 x 96 | 30 x 96 | 30 x 120 | 30 x 120 |

STAMPED METALLIC SHINGLES

METAL SLATES



Pig. 3278A

SHINGLES

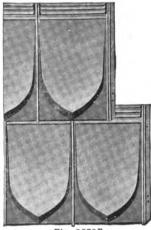


Fig. 3278B

SIDE LOCKS



Showing first position in laying Slate or Shingle on Roof



Fig. 3278D Showing Slate or Shingle laid in place

The Side Lock is an absolute lock, which cannot become unhooked after being laid, and cannot be pulled apart, at the same time providing amply for contraction and expansion of the metal.

In locking them there is no danger of leaving them unhooked at any point, the lock being always in view, and so constructed as to throw the Slate or Shingle square with the preceding one.

RIDGE COPING

ROLL RIDGE



Fig. 3278E

PLAIN RIDGE



Made from one piece of metal folded as shown in cuts, producing a storm-proof covering. The Slates or Shingles are inserted into the folds over the nailing flanges. thus protecting the nail heads from the weather.

IRON MACHINE SCREWS

ROUND, FLAT AND FILLISTER HEADS

PLAT HEAD



Fig. 8175A

ROUND HEAD



Fig. 8175B Adopted Jan. 1, 1898 FILLISTER HEAD



Pig. 8175C

| | | | | | | | PR | ICE, | PER G | ROSS | | T | | | |
|----------------|----------------------|-----|-----|------------------|--------------|--------------|------|------------------|--------------|--------------|------------------|--------------|--------------|------|----------|
| Nu | mber | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 |
| | 3 1 6 | .25 | .25 | .25 | .29 | .29 | .35 | .43 | | | | | | | |
| | 1/4 | .25 | .25 | .25 | .20 | .29 | .35 | .43 | .55 | .68 | | | | | |
| | 5 16 | .27 | .27 | .27 | .31 | .31 | .38 | .46 | .59 | .74 | .95 | | | | |
| | 3/8 | .27 | .27 | .27 | .31 | .31 | .38 | .46 | .59 | .74 | .95 | | 1 2 2 2 | 1.65 | |
| | 176 | .29 | .29 | .29 | .33 | .33 | .41 | .49 | .59 | .74 | .95 | 1.10 | 1.25 | 1.70 | |
| | 1/2 | .29 | .29 | .29 | .33 | .33 | .41 | .49 | .59 | .74 | .95 | 1.10 | 1,25 | 1.70 | |
| | 16 | .33 | .33 | .33 | .36 | .36 | .46 | .54 | .66 | .81 | 1.00 | 1.15 | 1.35 | 1.90 | |
| | 5/8 | .33 | .33 | ,33 | .36 | .36 | .46 | .54 | .66 | .81 | 1.00 | 1.15 | 1.35 | 1.90 | |
| Jes | 3/4 | .37 | .37 | .37 | .42 | .42 | .52 | .63 | .74 | .88 | 1.10 | 1.30 | 1.55 | 2.00 | 4.0 |
| Length, Inches | 7/8 | | .48 | .48 | .48 | .48 | .60 | .72 | .85 | 1.00 | 1.20 | 1.40 | 1.65 | 2.20 | 4.2 |
| I, | 1 | | | .55 | .55 | .55 | .70 | .85 | .97 | 1.15 | 1.35 | 1.55 | 1.80 | 2.55 | 4.50 |
| rth | 11/8 | | | .75 | .75 | .75 | .85 | 1.05 | 1.25 | 1.45 | 1.65 | 1.85 | 2.10 | 3.00 | 5.2 |
| eng | 114 | | | .75 | .75 | .75 | .85 | 1.05 | 1.25 | 1.45 | 1.65 | 1.85 | 2.10 | 3.00 | 5.2 |
| Ä | 13% | | | 1.00 | 1.00 | 1.00 | 1.15 | 1.35 | 1.60 | 1.80 | 2,00 | 2.20 | 2.50 | 3.60 | 6.0 |
| | 11/2 | | | 1.00 | 1.00 | 1.00 | 1.15 | 1.35 | 1.60 | 1.80 | 2.00 | 2.20 | 2.50 | 3.60 | 6.00 |
| | 13/4 | | | | | 1.25 | 1.35 | 1.70 | 1.80 | 2.05 | 2.40 | 2.55 | 2.90 | 4.10 | 6.6 |
| | 2 | | | | | 1.50 | 1.65 | 2.00 | 2.10 | 2.30 | 2.75 | 2.90 | 3.35 | 4.65 | 7.3 |
| | 214 | | | | | | 2.00 | 2.30 | 2.50 | 2.75 | 3.10 | 3.25 | 3.70 | 5.00 | 8.00 |
| | 21/2 | | | | | | 2.35 | 2.75 | 3.00 | 3.25 | 3.45 | 3.65 | 4.15 | 5.75 | 8.9 |
| | 23/4 | | | | | | 2.75 | 3.25 | 3.40 | 3.65 | 3,85 | 4.15 | 4.75 | 6.45 | 9.8 |
| | 3 | | | | | | 3.25 | 3.75 | 3.90 | 4.25 | 4.65 | 5.15 | 5.75 | 7.45 | 11.00 |
| Thr | eads | 56 | 48 | 32 and 36 | 32 and 36 | 30 and 32 | | 24, 30 and 32 | 20 and 24 | 20 and 24 | 16, 18 and 20 | 16 and 18 | 16 and 18 | 16 | 14 |
| abe | meter out thes | 5.4 | 3 2 | 6 ⁷ 4 | 1/8 | 8cant | 3,3 | 3 16 | 372 | 1/4 | 1764 | 3,3 | ,5 1 6 | 3/8 | 20 64 |

Any size of Screw, not listed above, shall take the list price of the next larger or longer length.



BRASS MACHINE SCREWS

ROUND, FLAT AND FILLISTER HEADS







Adopted Jan. 1, 1898

| ** | | | | | | | • | PRIC | E, PE | R GRO | OSS | | | | |
|----------------|----------------|-----|-------|------------------|--------------|--------------|--------------|------------------|------------------|--------------|------------------|--------------|------------------|-------|------------|
| Nu | mber | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 |
| | 136 | .32 | .32 | .32 | .40 | .40 | .58 | .86 | | | | | | | |
| | 1/4 | .32 | .32 | .32 | .40 | .40 | .58 | .86 | .90 | 1.15 | 1.55 | | | | |
| | 16 | .35 | .35 | .35 | .43 | .43 | .62 | .86 | 1.00 | 1.55 | 2.00 | | | | |
| | 3/8 | .35 | .35 | .35 | .43 | .43 | .62 | .86 | 1.00 | 1.55 | 2.00 | 2.55 | 3.00 | | |
| | 76 | .39 | .39 | .39 | .48 | .48 | .68 | .95 | 1.15 | 1.70 | 2.10 | 3.00 | 3.60 | | |
| | 1/2 | .39 | .39 | .39 | .48 | .48 | .68 | .95 | 1.15 | 1.70 | 2.10 | 3.00 | 3.60 | 6.00 | |
| | 16 | .48 | .48 | .48 | .57 | .57 | .77 | 1.05 | 1.30 | 1.90 | 2.35 | 3.25 | 3,90 | 6.30 | |
| | 5/8 | .48 | .48 | .48 | .57 | .57 | .77 | 1.05 | 1.30 | 1.90 | 2.35 | 3.25 | 3.90 | 6.30 | |
| es | 3/4 | .60 | .60 | .60 | .70 | .70 | .90 | 1.15 | 1.50 | 2.10 | 2.60 | 3.50 | 4.30 | 6.70 | |
| Length, Inches | 1/8 | | | .72 | .80 | .80 | 1.05 | 1.35 | 1.80 | 2.30 | 2.90 | 3.75 | 4.70 | 7.40 | |
| I | 1 | | | .80 | .90 | .90 | 1.20 | 1.55 | 2.10 | 2.60 | 3.20 | 4.00 | 5.20 | 8.50 | 15. |
| th, | 11/8 | | | 1.00 | 1.20 | 1.20 | 1.50 | 1.90 | 2.55 | 3.10 | 3.70 | 4.50 | 6.00 | 9.90 | 18. |
| ng | 11/4 | | | 1.00 | 1.20 | 1.20 | 1.50 | 1.90 | 2.55 | 3.10 | 3.70 | 4.50 | 6.00 | 9.90 | 18. |
| Le | 13/8 | | | 1.50 | 1.70 | 1.90 | 2.10 | 2.50 | 3.00 | 3.60 | 4.30 | 5.00 | 6.80 | 11.55 | 22,5 |
| | 11/2 | | | 1.50 | 1.70 | 1.90 | 2.10 | 2.50 | 3.00 | 3.60 | 4.30 | 5.00 | 6.80 | 11.55 | 22. |
| | 134 | | | | | 2.50 | 2.70 | 3.10 | 3.50 | 4.15 | 5.00 | 5.50 | 7.50 | 12.70 | 24.5 |
| | 2 | | | | | 3,30 | 3.70 | 4.00 | 4.40 | 4.90 | 5.75 | 6.50 | 8.25 | 13,55 | 26.0 |
| | 21/4 | | | | | | 4.50 | 5.00 | 5.50 | 6.00 | 6.65 | 7.50 | 9.25 | 14.95 | 28.0 |
| | 21/2 | | | | | | 6.00 | 6.50 | 7.00 | 7.50 | 8.00 | 9.00 | 10.50 | 15.50 | 30.5 |
| | $2\frac{3}{4}$ | | | | | | 6.50 | 7.50 | 8.00 | 9.00 | 10.00 | 11.00 | 12.00 | 17.00 | 33.0 |
| | 3 | | | | | | 7.50 | 8.50 | 9.00 | 10.00 | 11.00 | 12.50 | 14.00 | 19.00 | 36.0 |
| Thre | eads | 56 | 48 | 32 and 36 | 32 and 36 | 30 and 32 | 30 and 32 | 24, 30 and 32 | 20 and 24 | 20 and 24 | 16, 18 and 20 | 16 and 18 | 16 and 18 | 16 | 14 |
|)ian abo | | 64 | 3 3 2 | 6 ⁷ 4 | 1/8 | Seant | 5 3 2 | 3 1 6 | 3 ⁷ 3 | 1/4 | 17 64 | 3 3 | 1 ⁵ 6 | 3/8 | 2 9 6 4 |

Any size of Screw, not listed above, shall take the list price of the next larger or longer length.



SQUARE AND HEXAGON HEAD CAP SCREWS

SQUARE HEAD



HEXAGON HEAD



Fig. 1151A

Fig. 1151B

PRICE PER HUNDRED

| of | ameter f Head quare | 3/8 | 7/16 | 1/2 | 9/6 | 5/8 | 11/ | 34 | 7/8 | 11/8 | 114 | 13/8 | 11/2 |
|----------------------|----------------------------|------|--------------|--------|------------|-------|----------------|-------------|-------|----------------|-------|-----------|-------|
| o | ameter f Head exagon | 7/6 | 1/2 | % 6 | 5/8 | 34 | 13/6 | 7/8 | 1 | 11/8 | 11/4 | 13/8 | 11/2 |
| | ameter Screw | 1/4 | 5/6 | 3/8 | ₹ 6 | 1/2 | 9/6 | 5/8 | 3⁄4 | 7⁄8 | 1 | 11/8 | 11/4 |
| | 34 | 3.00 | 3.25 | 3.75 | 4.50 | 5.70 | | | | | | | |
| | 7∕8 | 3.15 | 3.40 | 3.90 | 4.70 | 5.80 | | • • • • | | , •••• | | | |
| | 1 | 3.25 | 3.50 | 4.00 | 4.90 | 5.90 | 9.25 | 9.25 | | ! . • • • • | | · · · · · | |
| zi. | 1!4 | 3.50 | 3.75 | 4.25 | 5.30 | 6.50 | 9.50 | 9.50 | 12.50 | ļ | ! | | |
| Point, Inches. | 11/2 | 3.75 | 4.00 | 4.50 | 5.70 | 7.10 | 10.00 | 10.00 | 13.50 | 18.40 | | | |
| t, In | 134 | 4.00 | 4.25 | 4.85 | 6.10 | 7.70 | 10.75 | 10.75 | 14.50 | 19.70 | 22.75 | | |
| oin | 2 | 4.25 | 4.85 | 5.20 | 6.50 | 8.30 | 11.50 | 11.50 | 15.50 | 21.00 | 25.00 | 34.00 | 38.50 |
| Je I | 214 | 4.70 | 5.35 | 5.55 | 7.15 | 8.90 | 12.60 | 12.60 | 16.50 | 22,40 | 27.25 | 36.75 | 42.00 |
| Ехтете | 21/2 | 5.25 | 5 .80 | 6.00 | 7.50 | 9.50 | 13.60 | 13.60 | 17.50 | 23.70 | 29.50 | 39.50 | 45.50 |
| | $2\frac{3}{4}$ | 5.75 | 6.30 | 6.65 | 7.90 | 10.10 | 14.40 | 14.40 | 19.00 | 25.00 | 31.75 | 42.25 | 49.00 |
| to | 3 | 6.25 | 6.80 | 7.20 | 8.40 | 10.70 | 15.20 | 15.20 | 20.60 | 26.40 | 34.00 | 45.00 | 52.50 |
| ead | 314 | ! | | | 9.15 | 11.50 | 16.00 | 16.00 | 22.10 | 28.20 | 36.25 | 47.75 | 56.00 |
| r H | 31/2 | 1 ! | | | 9.75 | 12.30 | 17.30 | 17.30 | 23.70 | 30.00 | 38.50 | 50.50 | 59.50 |
| ınde | 334 | , | | | 10.50 | 13.10 | 18.60 | 18.60 | 25.30 | 31.80 | 40.75 | 53.25 | 63.00 |
| Length under Head to | 4 | ١ | | | 11.10 | 13.90 | 19.90 | 19.90 | 26.90 | 33.60 | 43.00 | 56.00 | 66.50 |
| eng | 41/4 | 1 | | | · | | | 21.20 | 28.50 | 35.40 | 45.25 | 58.75 | 70.00 |
| 7 | 41/2 | ۱ ا | | | | | | 22.50 | 30.10 | 37.20 | 47.50 | 61.50 | 73.50 |
| | 434 | ۱ | | | | | l . | | 31.70 | 39.00 | 49.75 | 64.25 | 77.00 |
| ł | 5 | ١! | | ! | •••• | | l | i . •••• | | 40.80 | 52.00 | 67.00 | 80.50 |
| T to | hreads Inch | 20 | 18 | 16 | 14 | 12 | 12 | 11 | 10 | 9 | 8 | 7 | 7 |
| | dd for | .40 | .50 | .60 | .70 | .80 | 1.30 | 1.30 | 1.60 | 1.80 | 2.25 | 2.75 | 3.50 |

ROUND AND FILLISTER HEAD CAP SCREWS

PILLISTER HEAD



ROUND HEAD



Fig. 458A

Pig. 458B

PRICE PER HUNDRED

| O | iameter f Head Inches | ¾ 6 | 1/4 | 3/8 | % | %6 | 5⁄8 | 3⁄4 | 13/6 | ₹8 | 1 | 11/8 | 11/4 |
|--|------------------------------|------------|---------|-------|----------|------|-------|-------|-------|-------|---------------|---------------|----------------|
| O | Length of Head Inches | 1/8 | 3/16 | 1/4 | 516 | 3/8 | ₹⁄16 | 1⁄2 | %6 | 5/8 | 3⁄4 | 7⁄8 | 1 |
| of | iameter f Screw Inches | 1⁄8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/16 | 1⁄2 | %s | 5/8 | 3⁄4 | 7⁄8 | 1 |
| [| 3/4 | 2.00 | 2.25 | 2.50 | 3.00 | 3.50 | 4.00 | 5.00 | | | | | |
| 1 | 1 | 2.25 | 2.50 | 2.75 | 3.25 | 3.75 | 4.25 | 5.30 | 6.60 | | • • • • | | |
| | 11/4 | 2.50 | 2.75 | 3.00 | 3.50 | 4.00 | 4.50 | 5.60 | 6.90 | 9.00 | | | |
| | 11/2 | 2.75 | 3.00 | 3.25 | 3.75 | 4.25 | 4.75 | 5.90 | 7.20 | 9.50 | 12.00 | | · • • • • |
| | 13/4 | 3.00 | 3.25 | 3.50 | 4.00 | 4.50 | 5.00 | 6.20 | 7.50 | 10.00 | 12.50 | 15.25 | |
| Length under nead to Extreme Fourt, inches | 2 | 3.25 | 3.50 | 3.75 | 4.35 | 5.00 | 5.50 | 6.75 | 8.00 | 10.75 | 13.00 | 16.00 | 19.2 |
| 3 | 21/4 | 3.50 | 3.75 | 4.00 | 4.75 | 5.50 | 6.00 | 7.25 | 8.50 | 11.50 | 13.75 | 16.75 | 20.2 |
| 5 | $2\frac{1}{2}$ | 3.75 | 4.00 | 4.25 | 5.15 | 6.00 | 6.50 | 7.75 | 9.00 | 12.00 | 14.50 | 17.50 | 21.2 |
| שַׁ | 23/4 | 4.00 | 4.25 | 4.50 | 5.55 | 6.50 | 7.00 | 8.25 | 9.50 | 12.75 | 15.25 | 18.30 | 22.4 |
| 12 | 3 | 4.25 | 4.50 | 4.75 | 5.95 | 7.00 | 7.50 | 8.75 | 10.00 | 13.50 | 16.00 | 19.10 | 23.6 |
| | 31/4 | • • • • | 4.75 | 5.00 | 6.35 | 7.50 | 8.00 | 9.25 | 10.50 | 14.25 | 16.75 | 20.00 | 24.8 |
| 3) | 31/2 | | | 5.25 | 6.75 | 8.00 | 8.50 | 9.75 | 11.00 | 15.00 | 17.50 | 21.00 | 26.1 |
| 7 | 33/4 | | | | 7.15 | 8.50 | 9.00 | 10.25 | 11.50 | 15.75 | 18.25 | 22.00 | 27.3 |
| = | 4 | | | | | 9.00 | 9.50 | 10.75 | 12.00 | 16.50 | 19.00 | 23.00 | 28.6 |
| | 41/4 | | | | | | 10.00 | 11.25 | 12.50 | 17.25 | 19.75 | 24.00 | 29.8 |
| | 41/2 | | | | | | | 11.75 | 13.00 | 18.00 | 20.50 | 2 5.00 | 31.1 |
| | 434 | | ا ا | | | | | 12.25 | 13.50 | 18.75 | 21.25 | 26 .00 | 32.3 |
| 3 | 5 | | ١ إ | • • • | | ١ | | 12.75 | 14.00 | 19.50 | 22.00 | 27.00 | 33.6 |
| - | 51/4 | • • • • | ٠ | | | | | 13.25 | 14.50 | 20.25 | 22.75 | 28.00 | 34.8 |
| | 51/2 | | • • • • | | | | | 13.75 | 15.00 | 21.00 | 23.50 | 29.00 | 36.1 |
| | $5\frac{3}{4}$ | | | | | , | •••• | 14.25 | 15.50 | 21.75 | 24.25 | 30.00 | 37.3 |
| Į | 6 | | | | | | | 14.75 | 16.00 | 22.50 | 25.00 | 31.00 | 38.6 |
| Chre | ads to Inch | 40 | 24 | 20 | 18 | 16 | 14 | 12 | 12 | 11 | 10 | 9 | 8 |
| | d for each | .25 | .25 | .25 | .40 | .50 | .50 | .50 | .50 | .75 | .75 | 1.00 | 1.2 |

Round Heads made to order only.



FLAT AND BUTTON HEAD CAP SCREWS





Fig. 8176A Fig. 8176B

FLAT HEAD CAP SCREWS, PRICE PER HUNDRED

| Diameter of Inches | | 1/4 | 3/8 | $\frac{15}{32}$ | 5/8 | 3/4 | 13/16 | 7/8 | 1 | 11/8 | 13/8 |
|-----------------------|--|--------------------------------------|--|--|--|--|---|--|---|----------------------------------|---|
| Diameter of Inches | | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | %6 | 5/8 | 3/4 |
| Length Inc | 3/4 1 11/4 11/2 13/4 2 21/4 21/2 23/4 3 | 2.25 2.50 2.75 3.00 3.25 | 2.50 2.75 3.00 3.25 3.50 3.75 | 3.10 3.35 3.60 3.85 4.10 4.35 4.75 | 4.00 4.25 4.50 4.75 5.00 5.50 6.00 6.50 7.00 | 5.00 5.30 5.60 5.90 6.20 6.75 7.25 7.75 8.25 8.75 | 6.60 6.90 7.20 7.50 8.00 8.50 9.00 9.50 10.00 | 9.00 9.50 10.00 10.75 11.50 12.00 12.75 13.50 | 12.00 12.50 13.00 13.75 14.50 15.25 16.00 | 15.25 16.00 16.75 17.50 | 19,20 20,20 21,25 22,40 23,60 |
| Threads to | Inch | 40 | 24 | 20 | 18 | 16 | 14 | 12 | 12 | 11 | 10 |
| Add for Each | ¼ Inch | .25 | .25 | .40 | 50 | .50 | .50 | .50 | .75 | 1.00 | 1.25 |

BUTTON HEAD CAP SCREWS, PRICE PER HUNDRED

| | - | | | | | | | | | | |
|---|--|--------------------------------------|--|--|--|--|--|---|--|---|--|
| Diameter of Hea | | $\frac{7}{32}$ Full | 5/6 | 7/16 | 9/6 | 5/8 | 3/4 | 13/16 | 15/16 | 1 | 11/4 |
| Diameter of Boo | dy | 1/8 | 3/16 | 1/4 | 16 | 3/8 | 7/16 | 1/2 | %6 | 5/8 | 3/4 |
| Length Under Head to Extreme Point Inches | 14 14 14 14 14 14 14 14 14 14 14 14 14 1 | 2.25 2.50 2.75 3.00 3.25 | 2.50 2.75 3.00 3.25 3.50 3.75 | 3.00 3.25 3.50 3.75 4.00 4.35 4.75 | 3.50 3.75 4.00 4.25 4.50 5.00 5.50 6.00 | 4.00 4.25 4.50 4.75 5.00 5.50 6.00 6.50 7.00 | 5.00 5.30 5.60 5.90 6.20 6.75 7.25 7.75 8.25 8.75 | 6.60 6.90 7.20 7.50 8.00 8.50 9.00 9.50 10.00 | 9.00 9.50 10.00 10.75 11.50 12.00 12.75 13.50 | 12.00 12.50 13.00 13.75 14.50 15.25 16.00 | 18.20 19.20 20.20 21.25 22.40 23.60 |
| Threads to Inc | h | 40 | 24 | 20 | 18 | 16 | 14 | 12 | 12 | 11 | 10 |
| Add for Each ¼ I | nch | .25 | . 25 | .40 | .50 | ,50 | .50 | .50 | .75 | .75 | 1.15 |

* No. 4 Wire.

IRON SET SCREWS





HEADLESS



Fig. 5564B

Fig. 5564C

PRICE PER HUNDRED

| | eter of , Inches | 1/4 | 5/16 | 3/8 | 7/6 | $\frac{1}{2}$ | %6 | 5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/4 |
|-----------------------|--------------------------|------|------|------|------|---------------|-------|-------|-----------------|-------|-------|-------|-------|
| | (1/6 | 1.80 | 2.00 | 2.35 | | | | | | | | | |
| | 5% | 1.90 | 2.10 | 2.45 | 2.80 | 3.30 | | | | | | | |
| it. | 3/4 | 2.00 | 2.20 | 2.50 | 2.90 | 3.40 | 5.00 | 5.00 | | | | | |
| ic | 1/2 5/8 3/4 7/8 | 2.10 | 2.30 | 2.60 | 3.00 | 3.60 | 5.50 | 5.50 | | | | | |
| Point. | 1 | 2.15 | 2.35 | 2.65 | 3.10 | 3.80 | 5.75 | 5.75 | 10.00 | | | | |
| 16 | 11/4 | 2.30 | 2.50 | 2.85 | 3.50 | 4.30 | 6.50 | 6.50 | 11.00 | 15.50 | | | |
| under Head to Extreme | 11/2 | 2.50 | 2.70 | 3.10 | 4.00 | 4.80 | 7.25 | 7.25 | 12.00 | 16.20 | 22.00 | | |
| t | 134 | 2.75 | 3.00 | 3.50 | 4.50 | 5.40 | 8.00 | 8.00 | 12.80 | 17.70 | 24.00 | 41.70 | |
| E | 24 | 3.25 | 3.50 | 4.00 | 5.15 | 6.00 | 8.80 | 8.80 | 13.60 | 19.20 | 26.00 | 45.00 | 54.0 |
| - | 21/4 | 3.75 | 4.00 | 4.50 | 5.75 | 6.75 | 9.60 | 9.60 | 14.50 | 20.70 | 28.00 | 48.30 | 58.3 |
| 2 | 21/2 | 4.25 | 4.50 | 5.00 | 6.35 | 7.50 | 10.40 | 10.40 | 15.40 | 22.20 | 30.00 | 51.60 | 62.6 |
| 20 | 23/4 | 4.75 | 5.00 | 5.50 | 6.75 | 8.25 | 11.20 | 11.20 | 16.30 | 23.70 | 32.00 | 54.90 | 66.9 |
| Ie | 3 | 5.25 | 5.50 | 6.00 | 7.20 | 9.00 | 12.00 | 12.00 | 17.30 | 25.20 | 34.00 | 58.20 | 71.2 |
| - | 31/4 | | 2.77 | | 7.60 | 9.75 | 12.75 | 12.75 | 18.40 | 26.70 | 36.00 | 61.50 | 75.5 |
| Je | 31/2 | | | | 8.00 | 10.50 | 13.50 | 13.50 | 19.50 | 28.20 | 38.00 | 64.80 | 79.8 |
| ĕ | 33/4 | | | | 8.50 | 11.25 | 14.30 | 14.30 | 20.75 | 29.70 | 40.00 | 68.10 | 84.1 |
| 2 | 4 | | | | 9.00 | 12.00 | 15.10 | 15.10 | 22.00 | 31.20 | 42.00 | 71.40 | 88.4 |
| Length | 41/4 | | | | | 12.00 | 10.10 | 15.90 | 23.50 | 32.70 | 44.00 | 74.70 | 92.7 |
| a d | 41/2 | | | | *** | | 1 | 16.70 | 25.00 | 34.20 | 46.00 | 78.00 | 97.0 |
| Le | 43/4 | | | | | | | 1 | 26.50 | 35.70 | 48.00 | 81.30 | 101.3 |
| | 5 | | | | | | | | and the same of | 37.20 | 50.00 | 84.60 | 105.6 |
| | (0 | | | | | | | | | 01.20 | 00.00 | 01.00 | 100.0 |
| | eads to | 20 | 18 | 16 | 14 | 12 | 12 | 11 | 10 | 9 | - 8 | 7 | 7 |
| Add f | or each | .50 | .60 | .70 | .80 | .90 | 1.10 | 1.10 | 1.50 | 1.70 | 2.25 | 3.30 | 4.30 |

FOR PRICE OF STEEL SET SCREWS, ADD 25 PER CENT TO THE ABOVE LIST

Cup and Oval Point Set Screws Case-hardened are regular. Points, such as, Dog, Oval, Flat, and Conical, are special and made to order. Low Head Set Screws, same list as regular. Headless set screws, same list as regular measurements taken over all.

CUP POINT



| HOLLOW Drawn Ste | | | | , |
|--------------------------|------|--------|------|------|
| Diameterinches | 3/8 | 1/2 | 5 % | 3/4 |
| Lengthinch | 3/8 | 9/6 | 11/6 | 7/8 |
| Threadsper " | 16 | 12, 13 | 1Î | 1Ŏ |
| Price per hundred | 3.30 | 3.90 | 5.40 | 8.40 |
| " Extra Kevs " | 1.15 | 1.75 | 2 30 | 3 50 |

Pig. 5564D

Pig. 5564E

ROUND POINT

THUMB **NUTS AND SCREWS**

STYLE A

Drop Forged from Steel
THUMB NUTS





Fig. 461A

Fig. 461B 3 6 9/6 For Bolt.....size **%** 3/6 1/2 5/8 Diam. Top, inches Price Blanks...per 100 1.75 3 8 $\frac{1}{3.25}$ 9/16 4.00 5.00 6.00 2.00 2.60 $\frac{-34}{7.25}$ $\frac{7}{10.50}$ 2.25

Tapped Nuts either U. S. or Whitworth Standard with base faced at right angles to hole, double list.



Fig. 461E Fig. 461C Fig. 461D Fig. 461F Fig. 461G PRICE OF BLANKS PER HUNDRED, OF ANY TYPE

Fig. 461H

| Length under Head | | | | | DIAMET | ER, INCE | ES | | | |
|-------------------|------|------|------|------|--------|----------|-------|-------|-------|-------|
| Inches | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/6 | 1/2 | 9/16 | 5/8 | 3/4 |
| 1/4 | 1.60 | 1.80 | 2.05 | 2.40 | 2.95 | | | | | |
| 1/2 | 1.70 | 1.90 | 2.15 | 2.50 | 3.05 | 3.80 | 4.75 | 5.85 | | |
| 3/4 | 1.80 | 2.00 | 2.25 | 2.60 | 3.20 | 4.00 | 5.00 | 6.20 | | |
| Ĺ * | 1.90 | 2.10 | 2.35 | 2.75 | 3 40 | 4.25 | 5.30 | 6.55 | 8.00 | 11.55 |
| 11/4 | 2.00 | 2.20 | 2.45 | 2.90 | 3.60 | 4.50 | 5.60 | 6.90 | 8.40 | 12.20 |
| 1/2 | 2.10 | 2.30 | 2.55 | 3.10 | 3.80 | 4.75 | 5.95 | 7.30 | 8.90 | 12.90 |
| 3/4 | | 2.40 | 2.70 | 3.30 | 4.05 | 5.05 | 6.30 | 7.75 | 9.40 | 13.60 |
| 2 | | 2.50 | 2.85 | 3.50 | 4.30 | 5.35 | 6.65 | 8.20 | 9.95 | 14.30 |
| 21/4 | | | 3.05 | 3.70 | 4.60 | 5.70 | 7.05 | 8.65 | 10.50 | 15.05 |
| 21/2 | | | 3.25 | 3.95 | 4.90 | 6.05 | 7.45 | 9.15 | 11.05 | 15.80 |
| 34 | | | 3.45 | 4.20 | 5.20 | 6.40 | 7.90 | 9.65 | 11.65 | 16.55 |
| 3 | | | 3.70 | 4.45 | 5.50 | 6.75 | 8.35 | 10.15 | 12.25 | 17.35 |
| $3\frac{1}{2}$ | | | | 5:00 | 6.15 | 7.55 | 9.25 | 11.25 | 13.50 | 19.05 |
| | | | | 5.60 | 6.90 | 8.45 | 10.25 | 12.40 | 14.85 | 20.75 |
| 1/2 | | | | | 7.70 | 9.35 | 11.35 | 13.70 | 16.35 | 22.60 |
| | | | | | 8.50 | 10.35 | 12 60 | 15.15 | 18.00 | 24.80 |
| 51/2 | | | | | 9.40 | 11.45 | 13.90 | 16.65 | 19.80 | 27.15 |
| 3 | | | | | | | 15.20 | 18.30 | 21.80 | 30.00 |

Threaded Screws, either U.S. or Whitworth Standard, double list prices.

When ordering, specify pattern by letter. Unless otherwise specified, blanks will be sent.

Style C can be furnished in $\frac{5}{32}$ and $\frac{7}{32}$ -inch diameters, up to 1-inch long.

Threaded Screws, except C and E, over 4 inches long, have threads running up only

When ordering Threaded Screws 1/2-inch diameter with V thread, state whether 12 or 13 threads are wanted.

COLLAR SCREWS AND PLANER HEAD BOLTS

COLLAR SCREW



Fig. 5630A

PRICE PER HUNDRED

| Diameter of Collar, Inches | 1/4 | $\frac{11}{32}$ | 7/16 | 1/2 | 5/8 | 11/16 | 13/16 | 15/16 | 1 | 11/4 |
|---|------|-----------------|------|------|-------|-------|-------|-------|-------|-------|
| Diameter of Screw, Inches | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 7/6 | 1/2 | 9/16 | 5/8 | 3/4 |
| 3/4 | 2.50 | 2.80 | 3.10 | 3.75 | 4.40 | 5.00 | 6.25 | - | | |
| 1 | 2.80 | 3.10 | 3.40 | 4.05 | 4.70 | 5.30 | 6.60 | 8.25 | | |
| B 11/4 | 3.10 | 3.40 | 3.70 | 4.35 | 5.00 | 5.60 | 7.00 | 8.60 | 11.25 | |
| £ 1½ | 3.40 | 3.70 | 4.00 | 4.70 | 5.30 | 5.95 | 7.40 | 9.00 | 11.90 | 15.00 |
| em 11/4 11/2 13/4 2 2 21/4 | 3.70 | 4.05 | 4.35 | 5.05 | 5.65 | 6.35 | 7.80 | 9.45 | 12.60 | 15.60 |
| E 2 | | 4.40 | 4.70 | 5:45 | 6.25 | 6.85 | 8.40 | 10.00 | 13.35 | 16.25 |
| | | | 5.05 | 5.95 | 6.85 | 7.40 | 9.00 | 10.60 | 14.15 | 17.10 |
| P 21/2 | | | 5.45 | 6.45 | 7.55 | 8.05 | 9.60 | 11.25 | 15.00 | 18.00 |
| under Head Point, Inch 31/3 31/4 33/4 | | | | 6.95 | 8.20 | 8.75 | 10.30 | 11.90 | 15.90 | 19.00 |
| Hoint, 3 | | | | 7.50 | 8.85 | 9.50 | 11.00 | 12.60 | 16.85 | 20.00 |
| 5.5 314 | | | | | 9.50 | 10.30 | 11.80 | 13,40 | 17.95 | 21.20 |
| od 31/2 33/4 | | | | | 10.20 | 11.10 | 12.60 | 14.30 | 19.10 | 22.60 |
| 33/4 | | | | | | 11.95 | 13.50 | 15.30 | 20.40 | 24.20 |
| 耳 4 | | | | | | 12.80 | 14,40 | 16.30 | 21.70 | 25.80 |
| bc 41/4 | | | | | | | 15.40 | 17.50 | 23.20 | 27.70 |
| Ten 41/4 41/2 43/4 | | | | | | | 16.40 | 18.70 | 24.70 | 29.60 |
| H 43/4 5 | | | | | | | | 20.10 | 26.50 | 31.80 |
| 5 | | | | | | | | 21,50 | 28.30 | 34.00 |
| Threads to Inch | 40 | 24 | 20 | 18 | 16 | 14 | 12 | 12 | 11 | 10 |
| Add for Each | .30 | . 40 | .50 | .60 | .80 | 1.00 | 1.30 | 1.60 | 2.00 | 2.40 |

PLANER HEAD BOLTS PRICE PER HUNDRED WITHOUT NUTS

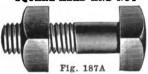
| | Diameter of Head | inches | 78 | 1 | 11 ₈ | 11/8 | 11/4 |
|------------|---|---|-------------------------|-------|-----------------|-------|-----------------------|
| | Length of Head | inches | 5/6 | 5/6 | 3,6 | 36 | 7/6 |
| | Diameter of Screw | inches | 1/2 | % | 5,8 | 11/6 | 3/4 |
| Pig. 5630B | Length under Head to Extreme Point Inches | $\begin{cases} 1 \\ 11\frac{7}{4} \\ 11\frac{7}{2} \\ 13\frac{7}{4} \\ 2 \end{cases}$ | 12.50 13.25 13.25 | 15.50 | 17.50 18.50 | 17.50 | $\frac{22.00}{22.50}$ |



MACHINE BOLTS

SQUARE HEAD AND NUT





Adopted Sept. 20, 1899



SQUARE HEADS, SQUARE NUTS AND FINISHED POINTS

Price per Hundred

| Length Inches | 14 | | | | DIAME | T | | | | | |
|------------------|------|------|-------------|----------|-------|---------|-------|-------|---------------|-------|--------|
| Inches | 14 | | | | DIAME | TER INC | HES | | | | |
| | /** | 516 | 3/8 | 716 | 1/2 | 9164 % | 3/4 | 7/8 | 1 | 11/8 | 11/4 |
| 3/4 to11/2 | 1.70 | 2.00 | 2.40 | 2.80 | 3.60 | 5.20 | 7.20 | 10.50 | 15.10 | 22.50 | 30.00 |
| 2 | 1.78 | 2.12 | 2.56 | 3.00 | 3.86 | 5.58 | 7.70 | 11.20 | 16.00 | 23.70 | 31.50 |
| 2½ | 1.86 | 2.24 | 2.72 | 3.20 | 4.12 | 5.96 | 8.20 | 11.90 | 16.90 | 24.90 | 33.00 |
| 3 | 1.94 | 2.36 | 2.88 | 3.40 | 4.38 | 6.34 | 8.70 | 12.60 | 17.80 | 26.10 | 34.50 |
| . 3½ | 2.02 | 2.48 | 3.04 | 3.60 | 4.64 | 6.72 | 9.20 | 13.30 | 18.70 | 27.30 | 36.00 |
| 4 | 2.10 | 2.60 | 3.20 | 3.80 | 4.90 | 7.10 | 9.70 | 14.00 | 19.60 | 28.50 | 37.50 |
| 41/2 | 2.18 | 2.72 | 3.36 | 4.00 | 5.16 | 7.48 | 10.20 | 14.70 | 20.50 | 29.70 | 39.00 |
| 5 | 2.26 | 2.84 | 3.52 | 4.20 | 5,42 | 7.86 | 10.70 | 15.40 | 21.40 | 30.90 | 40.50 |
| 51/2 | 2.34 | 2.96 | 3.68 | 4.40 | 5,68 | 8.24 | 11.20 | 16.10 | 22.30 | 32.10 | 42.00 |
| 6 | 2.42 | 3.08 | 3.84 | 4.60 | 5.94 | 8.62 | 11.70 | 16.80 | 23.20 | 33.30 | 43.50 |
| 61/2 | 2.50 | 3.20 | 4.00 | 4.80 | 6.20 | 9.00 | 12.20 | 17.50 | 24.10 | 34.50 | 45.00 |
| 7 | 2.58 | 3.32 | 4.16 | 5.00 | 6.46 | 9.38 | 12.70 | 18.20 | 25.00 | 35.70 | 46.50 |
| 71/2 | 2.66 | 3.44 | 4.32 | 5.20 | 6.72 | 9.76 | 13.20 | 18.90 | 25.90 | 36.90 | 48.00 |
| 8 | 2.74 | 3.56 | 4.48 | 5.40 | 6.98 | 10.14 | 13.70 | 19.60 | 26.80 | 38.10 | 49.50 |
| 9 | 2.30 | 3.80 | 4.80 | 5.80 | 7.50 | 10.90 | 14.70 | 21.00 | 28.60 | 40.50 | 52.50 |
| 10 | 3.06 | 4.04 | 5.12 | 6.20 | 8.02 | 11.66 | 15.70 | 22.40 | 30.40 | 42.90 | 55.50 |
| 11 | 3.22 | 4.28 | 5.44 | 6.60 | 8.54 | 12.42 | 16.70 | 23.80 | 32.20 | 45.30 | 58.50 |
| 12 | 3.38 | 4.52 | 5.76 | 7.00 | 9.06 | 13.18 | 17.70 | 25.20 | 34.00 | 47.70 | 61,50 |
| 13 | 3.54 | 4.76 | 6.08 | 7.40 | 9.58 | 13.94 | 18.70 | 26.60 | 35.8 0 | 50.10 | 64.50 |
| 14 | 3.70 | 5.00 | 6.40 | 7.80 | 10.10 | 14.70 | 19.70 | 28.00 | 37.60 | 52.50 | 67.50 |
| 15 | 3.86 | 5.24 | 6.72 | 8.20 | 10.62 | 15.46 | 20.70 | 29.40 | 39.40 | 54.90 | 70.50 |
| 16 | 4.02 | 5.48 | 7.04 | 8.60 | 11.14 | 16.22 | 21.70 | 30.80 | 41.20 | 57.30 | 73.50 |
| 17 | 4.18 | 5.72 | 7.36 | 9.00 | 11.66 | 16.98 | 22.70 | 32.20 | 43.00 | 59.70 | 76.50 |
| 18 | 4.34 | 5.96 | 7.68 | 9.40 | 12.18 | 17.74 | 23.70 | 33.60 | 44.80 | 62.10 | 79,50 |
| 19 | 4.50 | 6.20 | 8.00 | 9.80 | 12.70 | 18.50 | 24.70 | 35.00 | 46.60 | 64.50 | 82.50 |
| 20 | 4.66 | 6.44 | 8.32 | 10.20 | 13.22 | 19.26 | 25.70 | 36.40 | 48.40 | 66.90 | 85.50 |
| 21 | | | | | | | 26.70 | 37.80 | 50.20 | 69.30 | 88.50 |
| 22 | | | | | | | 27.70 | 39.20 | 52.00 | 71.70 | 91.50 |
| | | | | | | | 28.70 | 40.60 | 53.80 | 74.10 | 94.50 |
| 24 | | | | | | | 29.70 | 42.00 | 55.60 | 76.50 | 97.50 |
| 25 | | | | . | | | 30.70 | 43.40 | 57.4 0 | 78.90 | 100.50 |
| 26 | | | | | | | 31.70 | 44.80 | 59.20 | 81.30 | 103.50 |
| 27 | | | | | | | 32.70 | 46.20 | 61.00 | 83.70 | 106.50 |
| 28 | | | . . | | | | 33.70 | 47.60 | 62.80 | 86.10 | 109.50 |
| 29 | | | | | | | 34.70 | 49.00 | 64.60 | 88.50 | 112.50 |
| 30 | | | | | | | 35.70 | 50.40 | 66.40 | 90.90 | 115.50 |

The following extras are to be understood as a part of this list:

Bolts with Hexagon Heads or Hexagon Nuts, 10 per cent extra. If both Hexagon Heads and Hexagon Nuts, 20 per cent extra.

Joint Bolts with Oblong Nuts, 10 per cent extra.

Bolts with Tee Heads, Askew Heads and Eccentric Heads, 20 per cent extra.

Key Bolts, 20 per cent extra.

Bolts with Cotter Holes, 25 per cent extra.

In ordering Bolts please specify length from under head to point, except for countersunk Head Bolts, which are measured over all. Name the diameter first, and then the length, thus; ½x3.



BOLT ENDS

BOLT ENDS WITH SQUARE NUTS



Fig. 6588A

Adopted Jan. 30, 1895

| Size of Iron Inches | Length, Inches | Price per Pound | Size of Iron Inches | Length, Inches | Price per Pound |
|---------------------------------------|---|--|--|--|--|
| % and % 46 | 6 and 8 8 8 7 and 10 10 8 and 12 9 " 12 10 " 12 11 " 12 | .32 .25 .20 .18 .16 .14 .12 .10 | 11/4 13/8 13/8 15/8 13/4 13/8 21/4 21/4 | 14 15 16 17 18 19 20 22 24 | .11 .11 .12 .12 .12 .12 .12 .14 |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 11 12 12 13 13 | .10 .10 .10 | 2½ 2¾ 3 | 24 24 26 | .14 .16 .18 |

Hexagon Nuts, 10 per cent extra.

Bolt Ends ordered shorter than above Standard lengths, in lots of 100 and over will be charged at the price per hundred of Machine Bolts of same length, subject to same discount; in smaller lots, extra. Only the larger sizes enumerated are kept in stock.

EXTRA LENGTH OF THREADS AND EXTRA NUTS ON BOLTS

Net Prices

| Size of Boltinches | 1/4 | 5/16 | 3/8 | 7 ∕6 | 1/2 | 96 & 58 | 34 | ₹ 8 | 1 |
|--|--------------|-------------------|------|-------------|------|---------|---------------------|--|--------------|
| Extreme length of threadinches For each additional 1/2 inch of thread | 3/4 | 15/16 | 11/8 | 15/16 | 1½ | 1 1/8 | 214 | 25/8 | 3 |
| For one extra square nut " " " hexagon " " " " | $.02 \\ .25$ | .02 .35 .45 | .45 | .55 | .65 | | .08 1.35 1.75 | $\begin{array}{c} .10 \\ 2.00 \\ 2.50 \end{array}$ | 3.00 3.60 |
| Size of Nutinches | _ | | 5/16 | 3/8 | 7/6 | 1.10 | | 2.50 | |
| For one Thumb or Wing Nut in place of square or hexagon nuts. per 100 Bolts | | .40 | .50 | .60 | . 75 | .90 | . | | |

COMMON CARRIAGE BOLTS

WITH SHORT FULL SQUARE UNDER HEADS, FORGED NUTS AND FINISHED POINTS



Fig. 188A Adopted May 19, 1908

Price per Hundred

| • 4 } | | | DIAMET | ER, INCHES | | | |
|--|----------------|---|--------|---------------------|-------|----------|-------|
| Length Inches | 3/6 and 1/4 | 516 | 3/8 | 7/16 | 1/2 | % and 5% | 34 |
| 1 | 1:00 | 1.40 | 1.90 | 2.20 | | | |
| 11/4 | 1.00 | 1.40 | 1.90 | 2.20 | | · | |
| 112 | 1.00 | 1.40 | 1.90 | 2.20 | 3.00 | 5.20 | 7.20 |
| $ \begin{array}{c} 1\frac{1}{4} \\ 1\frac{1}{2} \\ 1\frac{3}{4} \\ 2 \end{array} $ | 1.04 | 1.46 | 1.98 | 2.29 | 3.00 | 5.20 | 7.20 |
| 2 | 1.08 | 1.52 | 2.06 | 2.38 | 3.00 | 5.20 | 7.20 |
| 214 21/2 23/4 | 1.12 | 1.58 | 2.14 | 2.47 | 3.00 | 5.20 | 7.20 |
| 512 | 1.16 | 1.64 | 2.22 | 2.56 | 3.00 | 5.20 | 7.20 |
| 23% | 1.20 | 1.70 | 2.30 | 2.65 | 3,11 | 5.37 | 7.43 |
| 3 | 1.24 | 1.76 | 2.38 | 2.74 | 3.22 | 5.54 | 7.66 |
| 31/ | 1 28 | 1.82 | 2.46 | 2.83 | 3.33 | 5.71 | 7.89 |
| 31/ | 1.28 1.32 | 1.88 | 2.54 | 2.92 | 3.44 | 5.88 | 8.12 |
| 31/4 31/2 33/4 | 1.36 | 1.94 | 2.62 | 3.01 | 3.55 | 6.05 | 8.35 |
| 4 | 1.40 | 2.00 | 2.70 | 3.10 | 3.66 | 6.22 | 8.58 |
| 41/ | 1.44 | 2.06 | 2.78 | 3.19 | 3.77 | 6.39 | 8.81 |
| 41/4 41/2 43/4 | 1.48 | $\frac{2.00}{2.12}$ | 2.86 | 3.28 | 3.88 | 6.56 | 9.04 |
| 43/ | 1.52 | 2.12 | 2.94 | 3.37 | 3.99 | 6.73 | 9.27 |
| 5 | 1.56 | 2.24 | 3.02 | 3.46 | 4.10 | 6.90 | 9.50 |
| 51/ | 1.64 | 2.36 | 3.18 | 3.64 | 4.32 | 7.24 | 9.96 |
| $\frac{5\frac{1}{2}}{6}$ | 1.72 | 2.48 | 3.34 | 3.82 | 4.54 | 7.58 | 10.42 |
| | 1.80 | 2.60 | 3.50 | 4.00 | 4.76 | 7.92 | 10.88 |
| $\frac{61}{2}$ | 1.88 | 2.72 | 3.66 | 4.18 | 4.98 | 8.26 | 11.34 |
| | 1.96 | 2.84 | 3.82 | 4.36 | 5.20 | 8.60 | 11.80 |
| 71/2 | 9.04 | 2.96 | 3.98 | 4.54 | 5.42 | 8.94 | 12.26 |
| 8 | $2.04 \\ 2.12$ | | 4.14 | 4.72 | 5.64 | 9.28 | 12.72 |
| 81/2 | 2.12 | $\frac{3.08}{3.20}$ | 4.30 | 4.90 | 5.86 | 9.62 | 13.18 |
| 9 | 2.20 2.28 | $\begin{array}{c} 3.20 \\ 3.32 \end{array}$ | 4.46 | 5.08 | 6.08 | 9.96 | 13.64 |
| 91/2 | 2.36 | | 4.62 | 5.26 | 6.30 | 10.30 | 14.10 |
| 10 | | 3.44 | 4.78 | 5.44 | 6.52 | 10.64 | 14.56 |
| 101/2 | 2.44 | $\frac{3.56}{3.68}$ | 4.94 | 5.62 | 6.74 | 10.98 | 15.02 |
| 11 | 2.52 | | 5.10 | $\frac{5.02}{5.80}$ | 6.96 | 11.32 | 15.48 |
| 111/2 | 2.60 | 3.80 | 5.26 | 5.98 | 7.18 | 11.66 | 15.46 |
| 12 | 2.68 | 3.92 | 5.58 | 6.34 | 7.62 | 12.34 | 16.86 |
| 13 | 2.84 | 4.16 | | 6.70 | 8.06 | | 17.78 |
| 14 | 3.00 | 4.40 | 5.90 | | | 13.02 | |
| 15 | 3.16 | 4.64 | 6.22 | 7.06 | 8.50 | 13 70 | 18.70 |
| 16 | 3.32 | 4.88 | 6.54 | 7.42 | 8.94 | 14.38 | 19.62 |
| 17 | 3.48 | 5.12 | 6.86 | 7.78 | 9.38 | 15.06 | 20.54 |
| 18 | 3.64 | 5.36 | 7.18 | 8.14 | 9.82 | 15.74 | 21.46 |
| 19 | 3.80 | 5. 6 0 | 7.50 | 8.50 | 10.26 | 16.42 | 22.38 |
| 20 | 3.96 | 5.84 | 7.82 | 8.86 | 10.70 | 17.10 | 23.30 |

STOVE BOLTS

FLAT OR ROUND HEAD

FLAT HEAD

ROUND HEAD





Fig. 8193A

Fig. 8193B

Adopted March 1, 1907

Price per Hundred

| Length | | | DIAMETER, INCHES | | |
|--|--------------|---------------------|------------------|------|------|
| Length, Inches | 1/8 and 5/82 | %6 | 7/32 and 1/4 | 5/16 | 3/8 |
| 3/8 | .85 | .85 | | | |
| 3/8 1/2 5/8 3/4 7/8 | .85 | .85 | 1.20 | | |
| 5/8 | .85 | .85 | 1.20 | | |
| 3/ | .85 | .85 | 1.20 | 1.75 | 2.65 |
| \tilde{v}_{k} | .90 | .90 | 1.25 | 1.80 | 2.70 |
| 1 " | .90 | .90 | 1.30 | 1.85 | 2.75 |
| Ī1⁄6 | .95 | .95 | 1.35 | 1.90 | 2.85 |
| ī́u | 1.00 | 1.00 | 1.40 | 1.95 | 2.90 |
| 13% | 1.05 | 1.05 | 1.45 | 2.00 | 3.00 |
| īí | 1.10 | 1.10 | 1.50 | 2.05 | 3.10 |
| 13% | 1.15 | 1.15 | 1.55 | 2.15 | 3.20 |
| $\mathbf{\tilde{2}}^{'}$ | 1.20 | 1.20 | 1.60 | 2.30 | 3.40 |
| 21/ | | 1.25 | 1.70 | 2.40 | 3.60 |
| 11/6 11/4 11/6 11/6 22/4 22/4 33/4 33/4 33/4 | | 1.30 | 1.80 | 2.50 | 3.80 |
| $23\mathbf{\tilde{a}}$ | | 1.40 | 1.90 | 2.60 | 4.00 |
| 3´¯ | | 1.50 | 2.00 | 2.70 | 4.20 |
| 31/4 | | 1.60 | 2.10 | 2.85 | 4.40 |
| 31% | | 1.70 | 2.20 | 3.00 | 4.60 |
| 3¾ | 1 | 1.80 | 2.30 | 3,15 | 4.80 |
| 4 | | 1.90 | 2.40 | 3.30 | 5.00 |
| | 1 | 2.00 | 2.50 | 3.45 | 5.20 |
| 41% | 1 | 2.10 | 2.60 | 3.60 | 5.40 |
| 434 | 1 | 2.20 | 2.70 | 3.75 | 5.60 |
| 5 - | 1 | 2.30 | 2.85 | 3.90 | 5.80 |
| 51/4 | | 2.40 | 3.00 | 4.10 | 6.00 |
| 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 1 | 2.50 | 3.15 | 4.30 | 6.20 |
| $5\widetilde{3}$ | 1 | 2.60 | 3.30 | 4.50 | 6.40 |
| 6 . | 1 | $\frac{2.75}{2.75}$ | 3.45 | 4.70 | 6.60 |
| $6\dot{\cancel{1}}$ | 1 | 2.90 | 3.60 | 4.90 | 6.80 |
| 61% | | 3.05 | 3.75 | 5.10 | 7.00 |

Nickel Plating, extra per hundred, 1.00.



TIRE AND ELEVATOR BOLTS



COMMON Adopted Dec. 28, 1899 Fig. 193A Price per Hundred

PHILADELPHIA Adopted Oct. 16, 1884

| | Haopto | <u>u Doc. D</u> | 0, 1000 | | | | | 000. 10, 10 | - |
|---|--------------|-----------------|---------|-------|---|--------|-----------|-------------|------|
| Length, | | | | Dı | ameter, I | NCHES. | | | |
| Inches | 1/8 and 3/16 | 1/4 | 5/6 | . 3/8 | 1/8 | 3/16 | 14 | 5/16 | 3/8 |
| 1 | .60 | .95 | 1.40 | 2.20 | 1.50 | 1.50 | | | |
| 11/4 | .60 | .95 | 1.40 | 2.20 | 1.50 | 1.50 | 1.90 | | |
| 1¼ 1½ 1¾ | .60 | .95 | 1.40 | 2.20 | 1.50 | 1.50 | 2.00 | 2.70 | |
| 134 | .65 | 1.00 | 1.40 | 2.20 | 1.50 | 1.50 | 2.15 | 2.85 | |
| - 2 | .70 | 1.05 | 1.47 | 2.20 | 1.50 | 1.60 | 2.25 | 3.05 | 5.00 |
| 21/ ₄ 21/ ₂ 23/ ₄ 3 | .75 | 1.10 | 1.54 | 2.30 | 1.50 | 1.65 | 2.40 | 3.20 | 5.20 |
| 21% | .80 | 1.15 | 1.61 | 2.40 | | 1.75 | 2.50 | 3.35 | 5.40 |
| 23% | .85 | 1.20 | 1.68 | 2.50 | | 1.80 | 2.65 | 3.50 | 5.60 |
| 3´* | .90 | 1.25 | 1.75 | 2.60 | | 1.90 | 2.75 | 3.65 | 5.80 |
| 3½ 3½ | .95 | 1.30 | 1.82 | 2.70 | l | 2.00 | 2.90 | 3.80 | 6.00 |
| 31/2 | 1.00 | 1.35 | 1.89 | 2.80 | | 2.10 | 3.00 | 3.95 | 6.20 |
| $3\frac{5}{4}$ | 1.05 | 1.40 | 1.96 | 2.90 | | | 3.15 | 4.10 | 6.40 |
| 4 | 1.10 | 1.45 | 2.03 | 3.00 | | | 3.25 | 4.25 | 6.60 |
| 414 | 1.15 | 1.50 | 2.10 | 3.10 | | | | | |
| 41/2 | 1.20 | 1.55 | 2.17 | 3.20 | | | | 4.55 | 7.00 |
| 434 | 1.25 | 1.60 | 2.24 | 3.30 | | | | | |
| 5 4 | 1.30 | 1.65 | 2.31 | 3.40 | 1 | 1 | | 4.90 | 7.40 |
| 514 | 1.35 | 1.70 | 2.38 | 3.50 | | | :::: | | ł . |
| 512 | 1.40 | 1.75 | 2.45 | 3.60 | · · · · · | •••• | 1 | | 7.80 |
| 514 51/2 534 | 1.45 | 1.80 | 2.52 | 3.70 | • | •••• | •••• | | 1 |
| 6 | 1.50 | 1.85 | 2.59 | 3.80 | | •••• | • • • • • | •••• | 8.20 |
| | 1.00 | 1.00 | 2.00 | 0.00 | 11 | | | | 0.20 |

FLAT HEAD

ELEVATOR BOLTS OVAL HEAD RELIANCE HEAD KEY HEAD BUTTON HEAD



Pig. 193B



Fig. 193C



C Fig. 193D Price per Hundred



Fig. 198E



Fig. 193P

| | | | DIAMETE | R, INCHES. | | |
|--|----------------|--------------|--|--------------|--------------------------|--------------|
| Length, | 3% and 14 | 5/6 | 3/8 | 3/6 and 1/4 | 3% and 1/4 | % and 1/4 |
| Inches | | Flat Head | <u>' </u> | Oval Head | Key & Re- liance Head | Button Head |
| 3/4 7/8 | 2.20 2.30 | 3.00 3.00 | | 1.50 | 1.50 1.60 | 1.50 1.60 |
| 1 | 2.30 | 3.00 | 4.00 | 1.60 1.70 | 1.60 1.70 | 1.60 |
| $1\frac{1}{8}$ $1\frac{1}{4}$ $1\frac{1}{2}$ | $2.40 \\ 2.50$ | 3.20 3.40 | 4.30 4.60 | 1.80 | 1.80 | 1.80 |

COUPLING AND BOILER STAY BOLTS

MILLED COUPLING BOLT





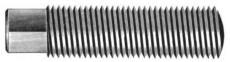


Fig. 5555A

Short Diameter of Nut.....inches

Fig. 55551

176

MILLED COUPLING BOLTS PRICE PER HUNDRED

| Dian | neter of Bolt inches | 1/2 | 5/8 | 3/4 | 7/8 | 1 | 118 | 1/4 |
|--------------|--|--|------|-----------------------|----------------|----------------|------|--------------------|
| Dian | neter of Headinches | 7/8 | 1 16 | 114 | 17/6 | 15 % | 113/ | 2 |
| Leng | th of Headinches | 1,2 | 5/8 | 34 | 7/8 | 1 | 118 | 11/4 |
| | ſ <u>2</u> | 20.00 | | | | | | |
| eme | | 20.50 | | | | | | |
| 91 | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $21.00 \\ 21.50$ | | | | | | |
| extro | 3 | 22.00 | | | | | | ::::: |
| £ 8 | 3½ | 22.50 | | 35.00 | | | | 100.00 |
| | $13\frac{1}{2}$ | 23.00 | | | | | | 100.00 |
| [ead inch | 33/4 | 23.50 | | | | | | 102.50 |
| | 41/4 | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | $\frac{38.00}{39.00}$ | 44.75 45.75 | | | 105.00 107.50 |
| under P | 41/2 | 25.00 | | | 46.75 | | | 110.00 |
| ğ ă | 434 | 25.50 | | 41.00 | 47.75 | 63.00 | | 112.50 |
| | 5 | 26.00 | | 42.00 | | 64.00 | | 115.00 |
| ıgt | 514 | 26.50 | | 43.00 | | | | 117.50 |
| Length | 5½ 5¾ | $27.00 \\ 27.50$ | | 44.00 45.00 | 50.75 51.75 | 66.00 67.00 | | $120.00 \\ 122.50$ |
| | 6 | 28.00 | | 46.00 | 52.75 | | | 122.50 125.00 |
| Thicl | kness of Nutinches | $-\frac{1}{2}$ | 5/8 | 34 | 7/8 | 1 | 11/8 | 114 |

Coupling Bolts are furnished with Hexagon Heads and Nuts. The bodies are turned and threaded, underside of head and bottom of nut are faced.

BOILER STAY BOLTS-12 Threads per Inch

PRICE PER HUNDRED

| Length of Thread | Ī | DIAMETER, INC | HES | Length | DIAMETER, INCHES | | | | | |
|---------------------|-------|---------------|---------|--------|------------------|----------|---------|--|--|--|
| Inches | 3/4 | Hand % | } and 1 | Inches | 34 | 13 and % | } and 1 | | | |
| 21/2 | 14.20 | 20.80 | 30.10 | 61/2 | 20.20 | 28.80 | 40.50 | | | |
| 3 | 14.95 | 21.80 | 31.40 | 7 - | 20.95 | 29.80 | 41.80 | | | |
| $3\frac{1}{2}$ | 15.70 | 22.80 | 32.70 | 71/2 | 21.70 | 30.80 | 43.10 | | | |
| 4 | 16.45 | 23.80 | 34.00 | 8 2 | 22.50 | 31.80 | 44.40 | | | |
| 41/2 | 17.20 | 24.80 | 35.30 | 9 | 24.00 | 33.80 | 47.00 | | | |
| 5 | 17.95 | 25.80 | 36.60 | 10 | 25.50 | 35.80 | 49.60 | | | |
| 51/2 | 18.70 | 26.80 | 37.90 | l ii l | 27.00 | 37.80 | 52.20 | | | |
| 6 | 19.45 | 27.80 | 39.20 | 12 | 28.50 | 39.80 | 54.80 | | | |

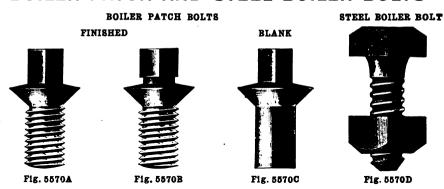
BOILER STAY BOLTS-12 Threads per Inch

LONGER THAN 12 INCHES

| Diameterinches | 3/1 | 13/6 and 7/8 | 15 and 1 |
|----------------|--------|--------------|----------|
| Priceper pound | .221/2 | .21 | .20 |



BOILER PATCH AND STEEL BOILER BOLTS



BOILER PATCH BOLTS

| Diameterinches | 12 | 9/16 | 5/8 | 11/6 | 3/4 | 13/6 |
|--|------------|---|--|--------------------------------------|-------------------------------------|---------------------------------------|
| Length inches Price, Blank, small lots each " Cut " " " " Blank, 25-lb lots per pound " Cut 25 " " " " | .04 | $^{5}_{8}$ to $^{11}_{4}$.05 .06 .22 .29 | 34 to 11/2 .05 .06 .20 .26 | 34 to 1½ .06 .07 .20 .26 | 38 to 2 .07 .08 .19 .24 | 1 to 2 .09 .11 .19 .24 |
| Diameterinches | 7/8 | 15 | 1 | 11/16 | 11/8 | 114 |
| Length inches Price, Blank, small lots each " Cut "" " " Blank, 25-lb lots per pound " Cut 25" " " | .10 .12 | 1 to 2 .13 .15 .18 .22 | 1 to 2½ .15 .17 .17 .20 | 1 to 2½ .18 .21 .17 .20 | 1 to 2½ .18 .21 .17 .20 | 1 to 21/2 .22 .25 .17 .20 |

Patch Bolts longer than specified, special prices. Shorter than specified, two cents per pound advance. With special thread in small lots an extra charge will be made

Unless otherwise ordered Patch Bolts will be furnished with 12 threads to the inch.

STEEL BOILER BOLTS WITH CONE POINTS AND PATENT RECESSED SQUARE NUTS Adopted March 19, 1907

Price Per Hundred

| , | DIAMETER, INCHES | | | | | | | | |
|-------------------|------------------|-------|-------|-------|--|--|--|--|--|
| Length under Head | 1,2 | 58 | 34 | 7/8 | | | | | |
| 116 | 6.00 | 9.00 | 12.70 | 18.80 | | | | | |
| 2 2 | 6.35 | 9.55 | 13.45 | 19.80 | | | | | |
| 21/6 | 6.70 | 10.10 | 14.20 | 20.80 | | | | | |
| 3 | 7.05 | 10.65 | 14.95 | 21.80 | | | | | |
| 31/6 | 7.40 | 11.20 | 15.70 | 22.80 | | | | | |
| 4 | 7.75 | 11.75 | 16.45 | 23.80 | | | | | |
| 41/2 | 8.10 | 12.30 | 17.20 | 24.80 | | | | | |
| 5 | 8.45 | 12.85 | 17.95 | 25.80 | | | | | |

These Bolts are made of soft steel with coarse threads, so that the nuts can be run on or off quickly by hand, and are fitted with recessed nuts and will be found of great convenience to boiler-makers, being much better adapted for "fitting up bolts" than the ordinary machine bolts.

STUD BOLTS





Fig. 1148A

Fig. 1148B

ROUGH, WITH COLD PUNCHED, CHAMFERED AND TRIMMED HEXAGON NUTS. PRICE PER HUNDRED

| Diame | terinches | 3/8 | 7/16 | 1/2 | 9/16 | 5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/4 |
|---------|----------------|------|------|------|-------|-------|-------|-------|-------|-------|-------|
| | 1½ | 4.00 | 5.10 | 5.50 | | | | | | | |
| | 13/4 | | 5.25 | 5.65 | | | | | | | |
| | 2 | 4.20 | 5.40 | 5.80 | 8.50 | 8.50 | 12.40 | | | | |
| | $2\frac{1}{4}$ | 4.30 | 5.55 | 5.95 | 8.75 | 8.75 | 12.70 | | | | |
| es | $2\frac{1}{2}$ | 4.40 | 5.70 | 6.10 | 9.00 | 9.00 | 13.00 | | | | |
| inches | $2\frac{3}{4}$ | 4.50 | 5.85 | 6.25 | 9.25 | 9.25 | 13.30 | | | | |
| ü. | 3 | 4.60 | 6.00 | 6.40 | 9.50 | 9.50 | 13.60 | | | | |
| | 31/4 | 4.70 | 6.15 | 6.55 | 9.75 | 9.75 | 13.90 | 19.50 | 28.40 | | |
| Length, | $3\frac{1}{2}$ | 4.80 | 6.30 | 6.70 | 10.00 | 10.00 | 14.20 | 20.00 | | | |
| ng | $3\frac{3}{4}$ | 4.90 | 6.45 | 6.85 | 10.25 | 10.25 | 14.50 | 20.50 | | | |
| ř | 4 | 5.00 | 6.60 | 7.00 | 10.50 | 10.50 | 14.80 | 21.00 | | | 64.00 |
| | $4\frac{1}{2}$ | 5.25 | 6.90 | 7.30 | 11.00 | 11.00 | 15.40 | 22.00 | | | |
| | 5 | 6.00 | 7.60 | 7.60 | 11.50 | 11.50 | 16.00 | 23.00 | 32,60 | | |
| | $5\frac{1}{2}$ | 7.25 | 8.00 | 8.00 | 12.00 | 12.00 | 16.60 | 24.00 | 33.80 | | |
| | 6 | 8.00 | 8.45 | 8.45 | 12.50 | 12.50 | 17.20 | 25.00 | 35.00 | 51.00 | 74.00 |
| Threa | ds to inch | 16 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 7 |

In ordering studs, please give length of thread wanted on each end, and length of body.

MILLED OR ROUGH, WITHOUT NUT, PRICE PER HUNDRED

| Diameterinches | 3/8 | 7/6 | 1/2 | %6 | -5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/4 |
|--|--|-----------|------|--|--|--|--|---|--|--|
| Tength, inches 1/4 1/2 13/4 2 1/4 2 | 3.50 3.65 3.80 3.95 4.10 4.25 4.40 | 5.55 5.75 | 7.20 | 5.10 5.30 5.50 5.70 6.10 6.30 6.50 6.70 7.30 7.40 7.50 7.60 7.70 7.80 | 6.10 6.30 6.50 6.70 6.90 7.10 7.50 7.70 7.90 8.10 8.25 8.40 8.55 8.70 9.15 9.30 | 8.80 9.10 9.40 9.70 10.00 10.30 10.60 10.90 11.20 11.45 11.90 12.10 12.35 12.55 12.80 13.00 | 12.00 12.50 13.00 14.50 14.50 15.40 15.75 16.15 16.50 16.90 17.25 17.65 | 17.00 17.75 18.50 19.25 20.00 20.50 21.00 21.50 22.00 22.50 23.50 | 21.00 22.00 23.00 24.00 25.00 25.75 26.50 27.25 28.00 28.75 29.50 30.25 | 27.00 28.00 29.00 29.75 30.50 31.25 32.00 32.75 33.50 34.25 |
| Threads to inch | 16 | 14 | 12 | 12 | 11 | 10 | 9 | 8 | 7 | 7 |
| Add for each 1/4 in. | .15 | .20 | .20 | .20 | .25 | .30 | .40 | .60 | .75 | 1.00 |

TRACK BOLTS, ETC.

WITH U. S. STANDARD SOUARE NUT



Fig. 5562A



Fig. 5562B

| | Bolts | Nuts | With Squ | ARE NUTS | WITH HEX | GON NUTS |
|-----------------|--------------------|--|-------------------------|-------------------------------|-------------------------|-------------------------------|
| Rails Used | Inches | Inches | Number 200-pound Keg | Kegs per Mile 4-Bolt Joint | Number 200-pound Keg | Kegs per Mile 4-Bolt Joint |
| 70 to 100 | 7/8×43/4 | 17/16 | 149 | 9.50 | 158 | 9.10 |
| | 7/8×41/2 | 176 | 155 | 9.20 | 163 | 8.83 |
| | 7/8×41/4 | 176 | 159 | 9.00 | 168 | 8.57 |
| | 7/8 x4 | $\frac{17_{16}}{17_{16}}$ | 163 | 8.75 | 173 | 8.32 |
| 45 to 85 | 3/4 x 4 1/4 | 11/4 | 224 | 7 | 230 | 6.3 |
| | 3/4 x4 | 11/4 | 231 | 6.3 | 240 | 6 |
| | 3/4 x33/4 | 11/4 | 239 | 6 | 254 | 5.7 |
| | 3/4 x31/2 | 11/4 | 240 | 6 | 260 | 5.5 |
| | 3/4 x31/4 | 11/4 | 250 | 5.7 | 266 | 5.4 |
| 3.5.5.5.6.6. | 3/4 x3 | 11/4 | 268 | 5.4 | 283 | 5.1 |
| 30 to 40 | 5/8x31/2 | 11/16 | 360 | 4.4 | 375 | 4 |
| 7 7 26 11 11 | 5/8x3 | 11/16 | 395 | 3.5 | 410 | 3.7 |
| | 5/8x23/4 | 11/16 | 420 | 3.4 | 435 | 3.3 |
| | 5/8×21/2 | 1 1/ | 445 | 3.3 | 465 | 3.1 |
| 20 to 30 | 1/2x3 | 7/16 | 665 | 2.2 | 715 | 2 |
| 20 TO A CO. CO. | 1/2821/2 | 78 | 715 | 2.2 | 760 | 2 |
| | | 11/6 7/8 7/8 7/8 7/8 11/6 11/6 | 750 | $\frac{2}{2}$ | | 2 |
| | 1/2 x21/4 | 78 | | 2 | 800 | 2 2 |
| | $\frac{1}{2}x^{2}$ | 1/8 | 775 | 2 | 820 | 2 |
| 8 to 16 | 3/8x2 | 116 | 1560 | 1 | | |
| | 3/8x13/4 | 116 - | 1680 | 1 | | |
| | 3/8×11/2 | 11/16 | 1800 | 1 | | |
| | 3/8×11/4 | 11/16 | 1975 | 1 | | |

EXTRAS PER 100 POUNDS OVER BASE

| Diameter Inches | | | | % | 1/2 | . 16 | | 14 | % | | |
|--|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|--|
| Length Inches | Square Nut | Hexagon Nut | Square Nut | Hexagon Nut | Square Nut | Hexagon Nut | Square Nut | Hexagon Nut | Square Nut | Hexagor Nut | |
| 3½ 3¼ 3 | Base | .15 | | | | | | | | | |
| 31/4 | .05 | .25 | .30 | . 55 | | | | | | | |
| 3 | .15 | .35 | . 40 | .65 | .75 | 1.10 | | | | | |
| 23/4 | | | .50 | . 75 | .90 | 1.25 | | | | | |
| $2i\sqrt{2}$ | | | .60 | .85 | 1.05 | 1.40 | 1.55 | 2.00 | | | |
| $2\frac{3}{4}$ $2\frac{1}{2}$ $2\frac{1}{4}$ 2 | | | | | 1.20 | 1.55 | 1.75 | 2.20 | 2.40 | 2.95 | |
| 2/4 | | | | | 1.35 | 1.70 | 1.95 | 2.40 | 2.65 | 3.20 | |
| 13/4 | | | | | | _,,,, | 2.15 | 2.60 | 2.90 | 3.45 | |
| 11/2 | :::: | | | | | | 2.10 | 2.00 | 3.15 | 3.70 | |

Base 34-inch and larger diameter by 31/2-inch and longer with square nut.

DRIFT BOLTS

Any length or diameter furnished to order. Square, in Plain, Pointed, Countersunk Head and Pointed, Swell Head and Pointed. Round, in Plain, Pointed, Countersunk Head and Pointed, Button Head and Pointed.

Digitized by Google

BRIDGE AND ROOF BOLTS



Pig. 1150A WITH SQUARE HEAD ON ONE END AND SQUARE NUT ON THE OTHER, OR SQUARE NUT ON EACH END, AS PREFERRED

| | Diameter, Inches | | | | | | | | | |
|---------------------|------------------|---------------------------|-----------------------------|-------------------------|--|--|--|--|--|--|
| Length | Price per Lb | % to 11% Price per Lb. | 1¼ to 1½ Price per Lb. | 1% to 2 Price per Lb | | | | | | |
| 30 inches to 4 feet | | .08% .08% .08 | .09%10 .08%10 .084/10 | .10 .09½0 .08%0 | | | | | | |
| 12 " 20 " | .08 | .07%o | .08 | .08½1o | | | | | | |

WITH BOTH ENDS UPSET AND FITTED WITH HEXAGON NUTS

| | | | | | | | | DIAMETER, INCHES | | | | | | | | |
|----|------|------|------|------|--|--|-----------|-------------------------|---------------------------|--------------------------|--------------------------|--|--|--|--|--|
| | | | L | ngth | | | | % to 1% Price per Lb | 1½ to 1½ Price per Lb. | 1% to 2 Price per Lb. | 2½ to 3 Price per Lb. | | | | | |
| 4 | feet | to 8 | feet | | | | | .12 | .121/10 | .13%10 | .141/10 | | | | | |
| 8 | 4 | 12 | и | | | | | .11 | .114/10 | .12%10 | .13%0 | | | | | |
| 12 | " | 16 | u | | | | | .10 | .10%0 | .11%10 | .12 ½ 10 | | | | | |
| 16 | 4 | 20 | u | | | | . | .09%10 | .09510 | .101/10 | .11%0 | | | | | |

STAY RODS

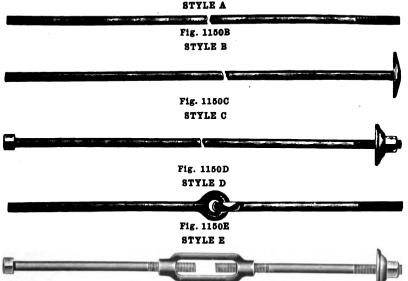
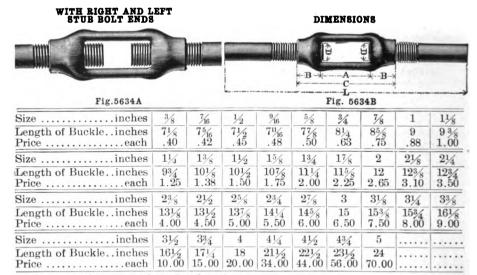


Fig. 1150F

We are prepared to furnish promptly Stay Rods any length and diameter and made in any style desired; also the necessary cast and wrought iron-washers. Prices quoted upon receipt of specifications.

TURNBUCKLES



Over 4 inches not made in first length.

Above prices are for first on Standard length turnbuckle, viz: 6 inches clear between heads.

Turnbuckles 9 inches in the clear between heads add 25 per cent to above prices. Turnbuckles 12 inches in the clear between heads add 50 per cent to above prices.

Turnbuckles 15 inches in the clear between heads add 100 per cent to above prices.

Turnbuckles 18 inches in the clear between heads add 250 per cent to above prices.

Turnbuckles 24 inches in the clear between heads three and one-half times above prices. Turnbuckles 36 inches in the clear between heads four times above prices.

Turnbuckles 30 inches in the clear between heads four times above prices.

Turnbuckles 48 inches in the clear between heads six times above prices.

Turnbuckles 72 inches in the clear between heads eight times above prices.

DIMENSIONS

| Sizeinches | 3/8 | 7/16 | 1/2 | %6 | 5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/4 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| Length (L)inches | 22 | 22 | 22 | 22 | 22 | 23 | 24 | 25 | 25 | 26 |
| Sizeinches | 13% | 11/2 | 15/8 | 13 % | 17/8 | 2 | 21/8 | 21/4 | 23/8 | 21/2 |
| Length (L)inches | _27 | 27 | 28 | 28 | 29 | 29 | 29 | 30 | 31 | 32 |
| Sizeinches | 25 g | 234 | 27/8 | 3 | 31/8 | 31/4 | 33/8 | 31/2 | 33/4 | 4 |
| Length (L)inches | 32 | 33 | 33 | 34 | 36 | 36 | 37 | 37 | 39 | 41 |

L-A-LENGTH OF TWO STUB ENDS

The size of the buckle is the outside diameter of the screw, same as bolts, nuts, etc.

Standard Length, 6 inches between heads (A) for all sizes.

| Standard | Lengtin | υ | menes | permeen | neaus, | (\mathbf{A}) | IOL | STIT | Size |
|----------|---------|----|-------|---------|--------|----------------|-----|------|------|
| Second | " | 9 | " | 44 | 44 | (A) | 4.6 | " | " |
| Third | " | 12 | " | • • | * * | (A) | " | " | " |
| Fourth | " | 15 | " | " | " | (A) | " | " | " |
| Fifth | " | 18 | " | 46 | 66 | (A) | " | ** | 66 |
| Sixth | ** | 24 | 44 | 44 | " | (A) | " | " | " |
| Seventh | ** | 36 | 66 | " | " | (A) | " | " | " |
| Eighth | " | 48 | " | " | . " | (A) | . " | 44 | " |
| Ninth | " | 72 | " | 64 | " | (A) |) " | ** | ** |



WROUGHT IRON TURNBUCKLES

WITH HOOK AND EYE

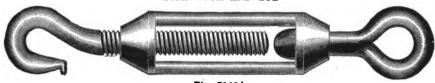
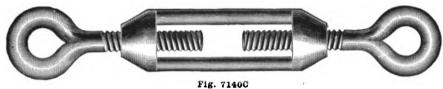


Fig. 7140A WITH TWO HOOKS



Fig. 7140B WITH TWO EYES



WITH EYE AND SHACKLE



Fig. 7140D

| Outside Diameter of Screw inches | 3/6 | 1/4 | 5/16 | 3/8 | 7/16 | 1/2 | % |
|--|-------|-------|-------|-------|-------|-------|-------|
| Length in the Clear bet. Headsinches | 31/2 | 4 | 414 | 434 | 5 | 6 | 6 |
| Price, Galvanizedeach | .80 | .85 | .90 | 1.10 | 1.25 | 1.50 | 1.85 |
| " Plain " | .70 | .75 | .80 | .90 | 1.00 | 1.30 | 1.70 |
| Outside Diameter of Screw inches | 5 8 | 34 | 7⁄8 | 1 | 11/8 | 114 | 13/8 |
| Length in the Clear between Headsins. | 85/8 | 9 | 10 | 1034 | 121/4 | 1234 | 141/2 |
| Price, Galvanizedeach | 2.20 | 3.25 | 5.00 | 5.50 | 7.00 | 8.25 | 9.50 |
| " Plain | 1.80 | 2.50 | 4.25 | 4.75 | 5.25 | 6.25 | 7.50 |
| Outside Diameter of Screw inches | 11/2 | 15/8 | 13/4 | 1 1/8 | 2 | 21/8 | 2!4 |
| Length in the Clear between Heads ins. | 15 | 16 | 18 | 18 | 24 | 24 | 24 |
| Price, Galvanizedeach | 11.00 | 15.00 | 20.00 | 25.00 | 28.00 | 33.50 | 38.50 |
| " Plain | 9.00 | 13.00 | 17.00 | 22.00 | 25.00 | 30.50 | 35.00 |

COACH AND HANGER SCREWS

GIMLET POINT COACH SCREW

HANGER SCREW



COACH AND LAG SCREWS Adopted, November 12, 1908 PRICE PER HUNDRED

| Length Under Head, Inches | 1/4, 5/6 | 3/8 | 7/6 | 1/2 | % 5/8 | 3/4 | 7/8 | 1 |
|---------------------------|----------|------|------|-------|-------|-------|-------|-------|
| 1½ | 2.25 | 2.70 | 3.15 | 3.75 | | | | |
| 2 | 2.45 | 2.96 | 3.47 | 4.11 | 6.00 | | | |
| 2½ | 2.65 | 3.22 | 3.79 | 4.47 | 6.50 | 9.20 | | |
| 3 | 2.85 | 3.48 | 4.11 | 4.83 | 7.00 | 9.90 | 15.00 | |
| 3½ | 3.05 | 3.74 | 4.43 | 5.19 | 7.50 | 10.60 | 16.00 | 22.00 |
| 4 | 3.25 | 4.00 | 4.75 | 5.55 | 8.00 | 11.30 | 17.00 | 23.30 |
| 4½ | 3.45 | 4.26 | 5.07 | 5.91 | 8.50 | 12.00 | 18.00 | 24,60 |
| 5 | 3.65 | 4.52 | 5.39 | 6.27 | 9.00 | 12.70 | 19.00 | 25,90 |
| 51/2 | 3.85 | 4.78 | 5.71 | 6.63 | 9.50 | 13.40 | 20.00 | 27.20 |
| 6 | 4.05 | 5.04 | 6.03 | 6.99 | 10.00 | 14.10 | 21.00 | 28.50 |
| 6½ | | | 6.35 | 7.35 | 10.50 | 14.80 | 22.00 | 29.80 |
| 7 | | | 6.67 | 7.71 | 11.00 | 15.50 | 23.00 | 31.10 |
| 71/2 | | | 6.99 | 8.07 | 11.50 | 16.20 | 24.00 | 32.40 |
| 8 | | | 7.31 | 8.43 | 12.00 | 16.90 | 25.00 | 33.70 |
| 9 | | | 7.95 | 9.15 | 13.00 | 18.30 | 27.00 | 36.30 |
| 0 | | | | 9.87 | 14.00 | 19.70 | 29.00 | 38.90 |
| 11 | | | | 10.59 | 15.00 | 21.10 | 31.00 | 41.50 |
| 12 | | | | 11.31 | 16.00 | 22.50 | 33.00 | 44.10 |

The following extras are to be understood as a part of this list. Hexagon Heads, 10 per cent extra. Tee Heads, 20 per cent extra. Skein screws sold at the same price as Lag Screws.

HANGER SCREWS Adopted, May 21, 1902 PRICE PER HUNDRED

| Length, Inches | 14, 1/6 | 3/8 | 1/16 | 1/2 | 5∕8 | 34 | <i>₹</i> 8 | 1 |
|-------------------|---------|------|------|-------|-------|-------|------------|-------|
| 2 | 3.00 | 3.60 | 4.24 | 5.06 | 6.19 | | | |
| $2\frac{1}{2}$ | 3.19 | 3.83 | 4.54 | 5.44 | 6.75 | 9.90 | | |
| 3 - | 3.38 | 4.05 | 4.84 | 5.81 | 7.31 | 10.73 | | |
| 31/2 | 3.57 | 4.28 | 5.14 | 6.19 | 7.88 | 11.55 | 15.00 | |
| 4 | 3.75 | 4.50 | 5.44 | 6.56 | 8.44 | 12.38 | 16.00 | |
| $4\frac{1}{2}$ | 3.94 | 4.73 | 5.74 | 6.94 | 9.00 | 13.20 | 17.00 | |
| 5 | 4.13 | 4.95 | 6.04 | 7.31 | 9.56 | 14.03 | 18.00 | 26.25 |
| $5\frac{1}{2}$ | 4.32 | 5.18 | 6.34 | 7.69 | 10.13 | 14.85 | 19.00 | 27.50 |
| 6 | 4.50 | 5.40 | 6.64 | 8.06 | 10.69 | 15.68 | 20.00 | 28.75 |
| $6\frac{1}{2}$ | | 5.62 | 6.94 | 8.43 | 11.25 | 16.50 | 21.00 | 30.00 |
| 7 | | 5.84 | 7.24 | 8.80 | 11.82 | 17.33 | 22.50 | 31.25 |
| $7\frac{1}{2}$ | | 6.06 | 7.54 | 9.17 | 12.38 | 18.15 | 23.44 | 32.50 |
| 8 | | 6.28 | 7.84 | 9.55 | 12.95 | 19.03 | 24.37 | 33.75 |
| 9 | | | 8.14 | 9.92 | 13.51 | 19.85 | 26.25 | 35.62 |
| 10 | | | | 10.30 | 14.08 | 20.68 | 27.50 | 37.50 |
| 11 | | | | | 14.64 | 21.50 | 28.75 | 39.38 |
| 12 | | | | | 15.21 | 22.32 | 30.00 | 41.25 |

STAR EXPANSION BOLTS

SQUARE HEAD LAG SCREW. MALLEABLE SHIELD







Fig. 4394A

Effective Jan. 1, 1911

Pig. 4394B

PRICE PER HUNDRED WITH SQUARE HEAD BOLTS

| Diameterinches | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 76 | 1/2 | 5/8 | 3/4 | 1/8 | 1 | 11/4 |
|----------------|------|------|-------|-------|-----|----|-----|-------|-------|-------|-------|--------|
| 11/2 | 7.84 | 8.98 | 10.13 | 11.60 | | | | | | | | |
| 2 | 7.88 | 9.07 | 10.85 | 11.65 | | | | | | | | |
| 2½ | | | | | | | | | | | | |
| 3 | 7.99 | 00 | | | | | | | | | | |
| 3 4 | 8.17 | | | | | | | | | | | |
| ਰ 5 ······ | | | | | | | | | | | | |
| = 6 | | | | | | | | | | 68.90 | 79.55 | |
| ₫ 7 | | | | | | | | | | 70.00 | | |
| ¥ 8 | | | | | | | | | | | | 174.45 |
| 9 | | | | | | | | | | | 85.75 | 181.10 |
| -1 0 | | | | | | | | | | 73.30 | | 187.75 |
| | | | | | | | | | | 74.40 | | 194.45 |
| 12 | | , | | | | | | 39.60 | 58.90 | 75.55 | 92.00 | 201.10 |

SHIELDS ONLY

| Diam. of Screws, inches | | | | | | | | | | | | |
|-------------------------|------|------|------|-------|-------|-------|-------|-------|-------|---------|------|--------|
| Priceper hundred | 7.40 | 8.40 | 9.40 | 10.50 | 13.35 | 17,75 | 22.00 | 27.80 | 39.95 | 53,30 (| 6.60 | 100.00 |

SEBCO SCREW ANCHORS-PRICE PER HUNDRED WITHOUT SCREWS

| Inside Diameter of Anchor Inches | Length of Anchor Inches | Outside Diameter of Anchor Inches | Diameter of Drill Inches | Anchors Fit Screw Numbers | Price Anchors Only | Number in Box |
|--|--|--|---|---------------------------------|--------------------------|------------------|
| 1/8 | 1/6 | 1/4 | 1/4 | 5-6-7 | 4.40 | 100 |
| 1/8 | 5/8 | 1/4 | 1/4 | 5-6-7 | 4.40 | 100 |
| 1/8 | 3/1 | 1/4 | 1/4 | 5-6-7 | 4.40 | 100 |
| 3/6 | 1/2 5/8 3/4 1/2 3/4 | 5/6 | 5/16 | 8-9-10-11 | 5.00 | 100 |
| 3/16 | 3/4 | 5/6 | 5/16 | 8-9-10-11 | 5.00 | 100 |
| 3/6 | 1 | 5/6 | 5/16 | 8-9-10-11 | 5.00 | 100 |
| 3/6 | 15/8 | 5/6 | 5/16 | 8-9-10-11 | 6.25 | 100 |
| 1/4 | 1/2 | 3/8 | 3/8 | 12-13-14 | 5.60 | 100 |
| 1/8/18/18/18/18/18/18/18/18/18/18/18/18/ | 1/2 3/4 | 1474 1616 1616 1616 1616 1616 1616 1616 | 1/4 5/16 5/16 5/16 5/16 5/16 5/16 5/16 5/16 | 12-13-14 | 5.60 | 100 |
| 1/4 | 1 | 3/8 | 3/8 | 12-13-14 | 5.60 | 100 |
| 1/4 | 11/2 | 3/8 | 3/8 | 12-13-14 | 6.75 | 100 |
| 1/4 | 2 | 3/8 | 3/8 | 12-13-14 | 7.80 | 100 |
| 5/6 | 3/4 | 7/6 | 7/6 | 15-16-17-18 | 6.25 | 100 |
| 5/6 | 1 | 7/6 | 7/6 | 15-16-17-18 | 6.25 | 100 |
| 5/6 | 11/2 | 7.6 7.6 7.6 7.6 7.6 7.6 | 716 716 716 716 716 | 15-16-17-18 | 7.50 | 100 |
| 5/6 | | 7/6 | 7/6 | 15-16-17-18 | 8.75 | 100 |
| 3/8 | 2 | 916 | 916 | 20-22-24 | 9.50 | 100 |
| 54 516 516 516 516 516 518 518 518 518 518 | $\begin{array}{c}2\\2\\2\\2\\2\end{array}$ | 11 | 11 16 | 26-28-30 | 14.50 | 100 |
| 5% | 2 | 13 | 13 | 5%-in. lag screw | 18.00 | 100 |
| 5/6 | 31/2 | 13 | 13 | 5%-in. lag screw | 21.00 | 100 |

STAR MACHINE EXPANSION BOLTS

SINGLE EXPANSION



Fig. 573A

DOUBLE EXPANSION



Fig. 573B

SINGLE EXPANSION

Price per Hundred with Square Head Bolts

| Diameterinches | 14 | 5/6 | 3 8 | 7/6 | 1/2 | 5.8 | 3/4 | 7/8 | 1 |
|----------------------------|-------------|-----------|-----------|-----------|-------|-------|-------|-------|-----------|
| 11/2 | 8.00 | 9.50 | | | | | | | |
| 2 | 8.20 | 9.50 | 11.80 | 15.25 | 18.00 | 24.00 | | | |
| $\frac{21}{2}$ | 8.30 | 9.55 | 11.90 | 15.50 | 18.25 | 24.50 | | •••• | • • • • • |
| m 3 | 8.40 | 9.60 | 12.00 | 16.00 | 18.50 | 25.00 | | | • • • • • |
| 2 3½ | 8.50 | 9.65 | 12.50 | 16.25 | 18.75 | 25.50 | 34.00 | ::::: | = |
| 81 31/2 H 4 4 4 41/2 | 8.60 | 9.70 | 13.00 | 16.50 | 19.00 | 26.00 | 34.50 | 43.00 | 54.00 |
| , <u>F</u> | 8.70 | 9.75 | 13.30 | 16.75 | 19.25 | 26.25 | 34.75 | 43.50 | 54.50 |
| É Ì 6 | 8.80 | 9.80 | 13.40 | 17.00 | 19.50 | 26.50 | 35.00 | 44.00 | 55.00 |
| 5 7 | | 9.90 | 13.60 | 17.25 | 19.90 | 27.00 | 35.50 | 45.00 | 56.00 |
| 1.ENGTH, 8 | | | •••• | | 20.20 | 27.50 | 36.00 | 46.00 | 57.00 |
| - S | | • • • • • | • • • • • | • • • • • | 20.50 | 28.00 | 37.00 | 47.00 | 58.00 |
| 10 | | | • • • • • | •••• | 20.65 | 28.25 | 38.00 | 48.00 | 59.00 |
| 11 | • • • • • • | | • • • • • | • • • • • | 20.80 | 28.50 | 39.00 | 49.00 | 60.00 |
| 12 | | •••• | ••• | | 21.00 | 29.00 | 40.00 | 50.00 | 61.00 |
| | | 117 | 12/ | 12/ | 22.50 | 29.50 | 41,00 | 51.00 | 62.00 |
| Length of Expansion inches | 1 | 11/2 | 13/4 | 134 | 13/4_ | 2 | 3_ | 33/4 | 334 |

DOUBLE EXPANSION Price per Hundred with Square Head Bolts

| Diameter | inches | | 5 ₁₆ | | 716 | _1/2_ | 5/8 | 3/4 | 78_ | 1 |
|-------------|---|----------------|-----------------|----------------------|------------------|-------------------|------------------------------|-----------------------|------------------------------|----------------|
| | $\begin{bmatrix} 1\frac{3}{4} \\ 2 \end{bmatrix}$ | 8.95 9.00 | 10.00 | | ••••• | •••• | | ••••• | | ••••• |
| | $2\frac{1}{2}$ | 9.05 | 10.00 | 12.40 | | | | | | • • • · · · |
| | $\frac{3}{3!}$ | 9.10 | 10.10 10.15 | $12.50 \\ 13.00$ | 16.60 16.80 | $20.00 \\ 20.15$ | 27.25 | •••• | •••• | ••••• |
| g¢, | 4 | 9.20 | 10.20 | 13.70 | 17.00 | 20.30 | 27.50 | 40.00 | | |
| Іменев | $\frac{41}{5}$ | $9.25 \\ 9.30$ | 10.25 10.30 | $ 13.80 \\ 13.90 $ | $17.25 \\ 17.50$ | $20.45 \\ 20.60$ | $27.75 \\ 28.00$ | 40.30 40.60 | 52.00 | |
| | 51/2 | 9.35 | 10.35 | 14.00 | 17.75 | 20.75 | 28.25 | 40.90 | 52.43 | 74.45 |
| LENGTH, | 6 6½ | 9.40 | 10.40 | $14.10 \\ 14.20$ | 18.00 18.10 | $20.90 \\ 21.05$ | $28.50 \\ 28.75$ | $\frac{41.20}{41.50}$ | 52.86 53.29 | 75.00 75.55 |
| LEN | 71/2 | •••• | | | $18.20 \\ 18.30$ | | $\frac{29.00}{29.25}$ | 41.80 42.10 | 53.72 54.15 | 76.10 76.65 |
| | 8 | | | 14.50 | 18.40 | 21.50 | 29.50 | 42.40 | 54.58 | 77.20 |
| | 9 10 | | | • • • • • | | $21.65 \\ 21.80$ | $29.75 \\ 30.00$ | 42.70 $ 43.00 $ | 55.01 55.44 | 77.75 78.30 |
| | 11 | | | | | 22.00 | 30.50 | 43.50 | 56.00 | 79.00 |
| Length of E | 12 xpansionins. | 11/2 | 17% | 23 4 | 21/2 | $oxed{23.50}{25}$ | $\frac{31.00}{3\frac{1}{4}}$ | 44.00 | $\frac{57.00}{4\frac{3}{4}}$ | 80.00 5 |

SHELLS ONLY

| Diameter of Screwinches | $\begin{bmatrix} 1_4' & 5_{16} \end{bmatrix}$ | $\begin{bmatrix} 3 & 7_{16} \end{bmatrix}$ | 5 x 34 | 78 1 |
|-----------------------------|---|--|-------------|-------------|
| Single Expansionper hundred | 7.50 8.50 | 10.50 14.00 16.00 | 21.00 29.00 | 36.00 44.00 |
| Double "" " | 8.00 9.00 | 11.00 15.00 18.00 | 24.00 35.00 | 44 00 63.00 |

HOT PRESSED SQUARE AND HEXAGON NUTS

SQUARE



U. S. STANDARD LIST Adopted Jan. 1, 1906 HEXAGON



Fig. 1143B

| Width | Thick- ness Inches | Hole Inches | Size of Bolt Inches | Price in 200-Pound Kegs Cents Per Pound | | Price in 200-Pound Kegs Cents Per Pound | | Square | | HEXAGON | |
|-----------------|--------------------------|---------------------------|------------------------------|---|--------|---|--------|--------|-----------------------|---------------------------------|--------|
| | | | | | | | | Num | rage ber in Keg | Average Number in One Keg | |
| | | | | Blank | Tapped | Blank | Tapped | Blank | Tapped | Blank | Tapped |
| 1/2 | 1/4 | 8 ∕6 | 1/4 | 13. | 15. | 20. | 22.5 | 13800 | 14760 | 17400 | 18600 |
| $\frac{19}{32}$ | 5/16 | 1/4 | 5/6 | 12. | 13.5 | 18. | 20. | 7400 | 7915 | 9200 | 9760 |
| 11/16 | 3/8 | 19 | 3/8 | 10.5 | 11.6 | 14. | 15.6 | 5000 | 5320 | 6000 | 6400 |
| 35 | ₹ 6 | 11 | 7/6 | 10. | 10.9 | 13. | 14.3 | 3200 | 3400 | 4000 | 4250 |
| $\frac{7}{8}$ | 1/2 | 13 32 | 1/2 | 9. | 9.7 | 11.2 | 12.2 | 2400 | 2540 | 3000 | 3200 |
| $\frac{31}{32}$ | %6 | 29 | % 6 | 9. | 9.6 | 11.2 | 12.1 | 1600 | 1690 | 2128 | 2275 |
| 11/6 | 5/8 | 33 | 5/8 | 8.7 | 9.2 | 10.5 | 11.2 | 1360 | 1440 | 1540 | 1630 |
| 11/4 | 3⁄4 | 5/8 | 3/4 | 8.5 | 8.9 | 10. | 10.6 | 832 | 880 | 998 | 1050 |
| 17/6 | 7 ∕8 | 87 | 7/8 | 8.4 | 8.8 | 9.9 | 10.5 | 544 | 578 | 628 | 665 |
| 15/8 | 1 | 37 | 1 | 8.4 | 8.8 | 9.9 | 10.5 | 376 | 397 | 436 | 460 |
| 113/6 | 11/8 | 15/26 | 11/8 | 8.4 | 8.8 | 9.9 | 10.5 | 268 | 284 | 288 | 305 |
| 2 | 11/4 | 11/16 | 11/4 | 8.4 | 8.8 | 9.9 | 10.5 | 206 | 220 | 250 | 260 |
| $2\frac{3}{16}$ | 13/8 | $1\frac{5}{32}$ | 13/8 | 8.5 | 9. | 10. | 10.7 | 146 | 157 | 182 | 190 |
| $2\frac{3}{8}$ | 11/2 | $1\frac{9}{32}$ | 11/2 | 8.8 | 9.4 | 10.3 | 11.1 | 120 | 127 | 144 | 150 |
| 2% | 15/8 | $1\frac{1}{3}\frac{3}{2}$ | 15/8 | 9. | 9.7 | 10.5 | 11.4 | 95 | 100 | 116 | 120 |
| $2\frac{3}{4}$ | 13/4 | 11/2 | 13/4 | 9.3 | 10. | 10.8 | 11.7 | 74 | 77 | 95 | 100 |
| $2\frac{1}{2}$ | 1 1/8 | 15/8 | 1 1/8 | 9.5 | 10.3 | 11. | 12. | 64 | 67 | 80 | 84 |
| $3\frac{1}{8}$ | 2 | 1 33 | 2 | 9.7 | 10.6 | 11.2 | 12.3 | 53 | 56 | 62 | 65 |
| $3\frac{5}{16}$ | 21/8 | 11% | 21/8 | 10. | 11. | 11.7 | 12.9 | 43 | 45 | 52 | 54 |
| 31/2 | $2\frac{1}{4}$ | 115/16 | $2\frac{1}{4}$ | 10. | 11.1 | 11.7 | 13. | 36 | 37 | 44 | 46 |
| 311/6 | $2\frac{3}{8}$ | 21/6 | 23/8 | 10.3 | 11.5 | 12.2 | 13.6 | 28 | 29 | 35 | 36 |
| 31/8 | $2\frac{1}{2}$ | 211. | $2\frac{1}{2}$ | 10.5 | 11.8 | 12.4 | 13.9 | 24 | 25 | 32 | 33 |
| 41/4 | 23/4 | 27 | 234 | 11. | 12.4 | 13. | 14.6 | 21 | 22 · | 27 | 27 |
| 45/8 | 3 | 25/8 | 3 | 11.5 | 13. | 13.5 | 15.2 | 16 | 17 | 18 | 18 |

For less than keg lots (200 pounds) of a size, add 20 cents per cwt. for 100 pounds or over. 50 cents per cwt. for less than 100 pounds.



COLD PUNCHED, CHAMFERED AND TRIMMED SQUARE AND HEXAGON NUTS

With Reamed Holes

SQUARE

HEXAGON



Fig. 1145A

U. S. STANDARD LIST Adopted Jan. 1, 1906



Fig. 1145B

| Width, Inches Thickness, Inches Hole, Inches | | | Hole, Inches Size of Bolt, Inches | Price in 200- Pound Kegs Cents Per Pound | | Price in 200- Pound Kegs Cents Per Pound | | Average Number In One Keg | | Average Number In One Keg | |
|--|---|---|--|---|-------|---|-------------|---------------------------------|---------|---------------------------|---------|
| | | le, Inches | | | | | | | | | |
| Wic This | ř | Siz | Blank | Tapped | Blank | Tapped | Blank | Tapped | Blank | Tapped | |
| 1/6 | 1/4 | 3/4 | 1/4 | 20. | 22. | 27. | 29.5 | 12600 | 13500 | 13800 | 14750 |
| 12 | 5,0 | 1/4 | 5% | 18. | 19.5 | 24. | 26. | 7600 | 8150 | 8933 | 9560 |
| ii. | 3% | 1 19 | 3/8 | 14.5 | 15.6 | 18.5 | 20.1 | 4600 | 4900 | 5500 | 5880 |
| 1/2 11/6 11/6 11/6 | 1/4 5/16 3/8 7/16 1/2 9/16 | 3 1 494 12 13 294 134 874 72 16 16 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18 | 1/4 5/16 8/8 7/16 1/2 9/16 5/8 3/4 7/8 | 14. | 14.9 | 18. | 19.3 | 3000 | 3200 | 3760 | 3990 |
| 1/8 | 1/2 | 13 | 1/2 | 11.3 | 12. | 14. | 15. | 2320 | 2450 | 2650 | 2800 |
| 31 | 9/6 | 39 | 9/6 | 11.3 | 11.9 | 14. | 14.9 | 1660 | 1750 | 1993 | 2110 |
| 11/6 | 5/8 3/4 7/8 | 33 | 5/8 | 10. | 10.5 | 12.5 | 13.2 | 1200 | 1270 | 1440 | 1525 |
| 11/4 | 34 | 5/8 | 3/4 | 9.7 | 10.1 | 11.4 | 12. | 740 | 780 | 896 | 950 |
| 114 | 7/8 | 17 | 7/8 | 9.6 | 10. | 11.1 | 11.7 | 480 | 500 | 567 | 600 |
| 1 5/8 1 13/6 | 1 | 37 | 1 | 9.6 | 10. | 11.1 | 11.7 | 344 | 365 | 408 | 435 |
| 113/6 | 11/8 | 15/6 | 11/8 | 9.6 | 10. | 11.1 | 11.7 | 244 | 260 | 296 | 313 |
| 2 | 11/4 | 1 1/6 | 11/4 | 10.1 | 10.5 | 11.5 | 12.1 | 180 | 192 | 208 | 220 |
| 23/16 | 13/8 | 1_{32}^{5} | 13/8 | 10.3 | 10.8 | 12. | 12.7 | 150 | 160 | 164 | 175 |
| 23/8 | 11/2 | $1\frac{9}{32}$ | 11/2 | 10.7 | 11.3 | 12.6 | 13.4 | 112 | 120 | 132 | 140 |
| 2% | 15/8 | $1\frac{13}{32}$ | 15/8 | 11.1 | 11.8 | 13.2 | 14.1 | 96 | 100 | 108 | 115 |
| $2\frac{3}{4}$ | 13/4 | 11/2 | 134 | 11.5 | 12.2 | 14. | 14.9 | 72 | 77 | 88 | 93 |
| 215 | 17/8 | 15/8 | 17/8 | 12. | 12.8 | 14.5 | 15.5 | 56 | 59 | 71 | 75 |
| 31/8 | 2 | 133 | 2 | 12. | 12.9 | 14.5 | 15.6 | 48 | 50 | 60 | 64 |
| 35/6 | 21/8 | 1136 | 21/8 | 12.5 | 13.5 | 15. | 16.2 | 40 | 42 | 52 | 55 |
| 31/2 311/6 | 21/4 | 115 | 214 | 12.5 | 13.6 | 15. | 16.3 | 32 | 33 | 46 | 48 |
| 3116 | 23/8 | 216 | 23/8 | 13.5 | 14.7 | 16. | 17.4 | 30 | 31 | 38 | 40 |
| $3\frac{7}{8}$ | 21/2 | 23/16 | 21/2 | 13.5 | 14.8 | 16. | 17.5 | 27 | 28 | 31 | 32 |
| 4 1/16 | 25.8 | 25/16 | 25 8 | 14. | 15.4 | 16.5 | 18.1 | 20 | 21 | 28 | 29 |
| 41/4 45/8 | 234 | 276 | 234 | 14. | 15.4 | 16.5 | 18.1 | 17 | 18 | 26 | 27 |
| 498 | 3 | 25/8 | 3 | 14.5 | 16. | 17. | 18.7 | 14 | 15 | 17 | 18 |
| 5 | 31/4 | 256 | 31/4 | 14.5 | 16.1 | 17. | 18.8 | 13 | 14 | 14 | 14 |
| 53/8 | 31/2 | $\frac{3\frac{3}{32}}{39}$ | 31/2 | 14.5 | 16.2 | 17. 18. | 18.9 20. | 9 5 | 10 5 | 11 8 | 11 8 |
| $6\frac{1}{8}$ | 4 | $3\frac{\%}{16}$ | 4 | 15.5 | 17.5 | 18. | 20. | о | 0 | ð | 8 |

For less than keg lots (200 pounds) of a size, add 20 cents per cwt. for 100 pounds or over. 50 cents per cwt. for less than 100 pounds.



FINISHED CASE-HARDENED AND SEMI-FINISHED HEXAGON NUTS

SEMI-FINISHED

FINISHED



Fig. 1294A

Adopted Feb. 21, 1906



Fig. 1294B

| | an : 1 | Size of | | | INISHED ON NUTS | Finished and Case Hardened Hexagon Nuts | | |
|-------------------|---------------------|----------------|----------------------|--------------------------|------------------------------------|---|-----------------------------------|--|
| Width Inches | Thickness Inches | Bolt Inches | Number of Threads | Price Regular Each | Price Double Chamfer Each | Price Regular Each | Price Double Chamfe Each | |
| 1/2 | 1/4 | 1/4 | 20 | .02 | .025 | .06 | .065 | |
| 19/82 | 5/16 | 516 | 18 | .025 | .0275 | .07 | .075 | |
| 11/16 | 3/8 | 3/8 | 16 | .0325 | .04 | .08 | .087 | |
| 25/82 | 1/16 | 7/6 | 14 | .0375 | .0475 | .09 | .10 | |
| 7∕8 | 1/2 | 1/2 | 12 or 13 | .045 | .055 | .10 | .11 | |
| 31/82 | % 6 | 916 | 12 | .055 | .065 | .12 | .13 | |
| 11/6 | 5/8 | 5/8 | 11 | .065 | .075 | .16 | .175 | |
| $1_{\frac{4}{3}}$ | 11/6 | 11/6 | 11 | .085 | .105 | .22 | .24 | |
| 11/4 | 3/4 | 3⁄4 | 10 | .085 | .105 | .22 | .24 | |
| 17/6 | ₹8 | 7∕8 | 9 | .12 | .145 | .27 | .295 | |
| 15/8 | 1 | 1 | 8 | .165 | .20 | .38 | .415 | |
| 111/6 | 11/8 | 11/8 | 7 | .22 | .265 | .50 | .545 | |
| 2 | 11/4 | 11/4 | 7 | .30 | .36 | .66 | .72 | |
| $2\frac{3}{16}$ | 13/8 | 13/8 | 6 | .45 | .53 | .90 | .97 | |
| $2\frac{3}{8}$ | 11/2 | 11/2 | 6 | .62 | .71 | 1.20 | 1.30 | |
| 2% | 15/8 | 15/8 | 51/2 | .82 | .94 | 1.45 | 1.58 | |
| $2\frac{3}{4}$ | 13/4 | $1\frac{3}{4}$ | 5 | 1.20 | 1.34 | 1.75 | 1.90 | |
| $2\frac{15}{16}$ | 17/8 | 17/8 | 5 | 1.45 | 1.65 | 2.50 | 2.70 | |
| 31/8 | 2 | 2 | 41/2 | 1.80 | 2.05 | 3.25 | 3.50 | |
| 31/2 | 21/4 | $2\frac{1}{4}$ | 4 1/2 | 2.75 | 3.10 | 5.50 | 6.00 | |
| $3\frac{7}{8}$ | 21/2 | $2\frac{1}{2}$ | 4 | 4.00 | 4.40 | 8,50 | 9.50 | |
| 41/4 | 23/4 | $2\frac{3}{4}$ | 4 | 5.50 | 6.10 | 12.00 | 13.50 | |
| 45/8 | 3 | 3 | 31/2 | 8.50 | 9.50 | 18.00 | 20.00 | |

For Nuts thinner or smaller than Standard, use regular list.

For Semi-Finished Nuts, case hardened, add 20 per cent to the list and use double chamfered list if rounded on top.

For Finished Nuts, not case hardened, use regular list.

For Nuts polished after case hardening add 30 per cent to the list.

The thread and outside of each Finished Nut is made to an accurate gauge and to the standard adopted by the U.S. Government. First-class in all respects.

The Semi-Finished Nuts correspond with the Finished Nuts in all dimensions they are U.S. Standard Nuts, tapped and faced true on the bottom.



WASHERS. ETC.

WROTIGHT IRON

CAST IRON

LOCK WASHER IMPROVED LOCK WASHER









Fig. 1146A

FIE. 1146B

Fig. 1146C

Fig. 1146D

WROUGHT IRON WASHERS U. S. Standard Sizes-In effect Jan. 20, 1910

| Diameter Inches | Size Hole Inches | Thickness of Wire Gauge Number | Size of Bolt Inches | Price per Pound in 200-pound Kegs | Number of Washers in 100 Pounds |
|--|---|--------------------------------------|---------------------------------------|--------------------------------------|------------------------------------|
| 9/4 | 1/1 | 18 | 316 | 14.00 | 39400 |
| 3/4 | 1 4 5 6 | 16 | 1 7 | 12.20 | 15600 |
| 916 34 78 | 38 | 16 | 5. | 11.40 | 11250 |
| 1′8 | | 14 | 5.7 16 3.8 | 10.50 | 6800 |
| 11.7 | 7/16 1/2 9/16 5/8 11/16 13/16 11/16 | 14 | 72 | 9.80 | 4300 |
| $ \begin{array}{c} 114\\ 138\\ 119\\ 134\\ 2 \end{array} $ | 9/ | 12 | 7 716 1 9 9 16 | 9.40 | 2600 |
| 112 | ∑16 5∠ | 12 | 97 | 9.30 | 2250 |
| 13/2 | 11/8 | 10 | . 16 5 | 9.20 | 1300 |
| 174 | ``16 13 | 10 10 | ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ | | 1010 |
| 91/ | 716 | | <u>_</u> 4 | 9.10 | |
| 21/4 21/2 23/4 3 | 176 | 9 | , / 8 | 9.00 | 860 |
| 21/2 | | 9 | 1 | 9.00 | 625 |
| 23/4 | 11/4 | 9 | 11/8 | 9.00 | 520 |
| 3 | 13/8 | 9 | 114 | 9.20 | 400 |
| 31/4 | $1\frac{1}{2}$ | 8 | $1\frac{3}{8}$ | 9.20 | 300 |
| 31/2 | $1^{\frac{5}{8}}$ | 8 | 11/6 | 9.20 | 280 |
| $\frac{31}{3}$ | 13% | 8 | 15% | 9.50 | 240 |
| 4´ - | $1\frac{1}{4}$ $1\frac{3}{8}$ $1\frac{1}{2}$ $1\frac{5}{8}$ $1\frac{3}{4}$ $1\frac{7}{8}$ | 8 | $\frac{15}{8}$ $\frac{13}{4}$ | 9.50 | 215 |
| 41/4 | $ar{2}^{'}$ | 8 | 17/8 | 9.50 | 190 |
| 4 1/4 4 1/2 | $ar{2}lat_8$ | l š | $ar{\mathbf{z}}^{'}$ $ar{\mathbf{z}}$ | 9.50 | 175 |

The above list prices apply only to full keg lots (200 pounds) of a size. For less than 200 pounds of a size or for special packing, the following extras will be charged, viz.:

.10 per 100 pounds for 100 pounds or more. At the rate of

.50 less than 100 pounds. ٠. " " .10 packing in 100-pound kegs. " " .. " 20

> " 1.00

packing in 50 to 100-pound boxes.

.30 44 44 " " packing in 25 to 50-pound boxes. " " 46 " .50 " 46 packing in 5-pound boxes. ..

packing in 1-pound boxes.

CAST IRON WASHERS

| Diameter, Inches | Hole, Inches | Thickness, Inches | Size of Bolt, Inches | Weight, Pounds |
|-------------------------------------|-------------------|-------------------|----------------------|----------------|
| 21/2 | 5/8 | 11/6 | 1/2 | 1/2 |
| $\frac{2\sqrt[3]{4}}{2\sqrt[3]{4}}$ | 34, | 34 | 5 8 | 5 <u>8</u> |
| 31/2 | 1 8 | 76 78 | 74 | 114 |
| 4 2 | 116 | 15 16 | 1, " | 15/8 |
| 41/2 | $\frac{1!4}{133}$ | 1 11/ | 118 | 214 |
| 6 | 134 | 11/4 | 1114 | 5 |

LOCK WASHERS OR NUT LOCKS

| For Bolts inches | 1/2 | 5 8 | 34 | 7/8 | 1 | 11/8 | 14 |
|--|---------------|----------------|-----------------------|----------------|----------------|----------------|----------------|
| Price, Lock Washers per thousand "Improved Lock Washers" | 9.50 11.50 | 10.00 12.00 | $\frac{12.50}{14.50}$ | 13.50 15.50 | 15.50 17.50 | 16.00 18.00 | 16.50 18.50 |

MALLEABLE IRON WASHERS







Fig. 7795A

Fig. 7795B

Fig. 7795C

| Diameter Inches | Hole Size of Bolt | Thickness Inches | COMPARATIV PER 100 WAS | | Price in 200 Pound Kegs |
|--------------------|----------------------|---------------------|---------------------------|-------------|----------------------------|
| inches | Inches | Thones | Malleable Iron | Cast Iron | Cents, per Pound |
| 21/2 | 1/2 | 34 | 15 | 45 | |
| $23\sqrt{4}$ | 5/8 | 5√6 | 22 | 66 | |
| 3 | 34 | 7∕16 | 33 | 100 | |
| 31/2 | 7/8 | 7 ∕16 | 50 | 150 | |
| 4 | 1 1 | 1/2 | 68 | 20 0 | |
| 41/2 | 11/8 | 1/2 | 87 | 262 | |
| 5 | 11/4 | 5/8 | 150 | 450 | |
| 6 | 11/2 | 34 | 190 | 575 | 1 |
| 6 | 137 | 34 | 206 | 618 | |
| 7⅓ | $ \cdot $ 2 | 3⁄4 | 420 | 1262 | |

When nut is turned up on bolt, place the point of a cold chisel in any one of the beveled slots and with one blow of hammer you will turn up a "burr" or "obstruction" as shown, which will effectually lock the Nut. Then give any one of the corners on outer edge of washer a blow with hammer (the assistance of a punch may be preferred), this will bend the corner into the wood, thereby preventing Washer from turning and creating a most reliable and positive Nut-Locking device.

To unlock nut, simply flatten the burr with blow from hammer (should this injure burr, for next occasion use any of the other slots).

To lock this washer when used on Iron Plates, instead of wood, use a pointed chisel and turn up a burr on the plate in one of the outer recesses of Washer.

These Washers are made of malleable iron as a substitute for the common, old style Cast-Iron Washers, with same diameter of bearing surface as Cast Washers, but about one half the thickness; thereby can be sold cheaper per washer than Cast Washers, besides producing a much stronger washer, saving 66 2 3 per cent of freight rates, hauling and weight to structure, also one-half to one inch in length of bolts, and adding the best Nut-Locking feature ever invented without additional expense to the purchaser.

The Nut-Locking features are molded and cast in washers without additional cost, and in no way interferes with the use of the washer as a plain washer, but is always ready to be used to lock Nut when desired.



POSITIVE LOCK WASHERS



Fig. 7651A

Positive Lock Washers are so constructed that the body of the washer carries the load of compression, and the tapered ends are thus relieved, and the spring is constant.

The barbs being free to move when subjected to vibration, force themselves deeply into the nut and metal backing.

The washers are reversible and can be used many times. They do not injure the nut, its threads, or the threads of the bolt.

Exhaustive tests covering a period many years on railroad track, drop presses, automobiles and machinery subjected to vibration, have proven its superiority over other makes of locknuts.

| == -, | | | | <u></u> | | ,= | | 7.5 | | | |
|------------------|--|--------------|--|---|-------------|------------|--|--------------|---|-----------------------|--------------|
| Bolt | Size Steel | Price per | Bolt | Size Steel | Price | Bolt | Size Steel | Price per | Bolt | Size Steel | Price per |
| Inches | Inches | 1000 | Inches | Inches | per 1000 | Inches | Inches | 1000 | Inches | Inches | 1000 |
| No. 6 | | 7.00 | 3 8 | -5x 32 | 7.70 | 12- | 3/6 X 3/16 | 8.12 | 3/ | 3/6 X 1/16 | 8.70 |
| " 8 | 32 X 64 | 7.00 | 38 | 37 A 37 8/ v 1/ | 7.70 | 1/2 | 716 4 716 | 7.90 | 3/4 | 3/ - 3 | 8.90 |
| " 10 | 32 4 64 | 7.00 | 3 8 | 316 X 16 | 7.70 | 1/2 | ⁷ 2 X 16 | 7.90 | 34 | 3/6 X 3/2 | 8.90 |
| " 12 | 32 X 64 | 7.00 | 8 | 316 X 3 | 7.70 | 1/2 | 32 X 64 | 8.10 | 34 | 36X18 | 8.90 |
| " 14 | 32 X 54 | | 1 58 1 | 316 X 1 × | | 12 | 32 X 1 8 | | 3/4 3/4 | 3 16 X 3 16 | |
| 14 | $\frac{3}{32} \times \frac{3}{64}$ | 7.00 | 1 / 5 | 3 16 X 3 16 | 7.70 | 1/2 | 1 4 X 1 16 | 7.90 | 24 | 14 X 16 | 9.00 |
| 316 | 1 ₁₆ X 1 ₁₆ | 7.00 | | $\frac{7}{32} \times \frac{1}{16}$ | 7.70 | 1/2 | 1 4 X 32 | 8.30 | 3/4 | 14 X 32 | 9.30 |
| 316 | $\frac{3}{32}$ X $\frac{3}{64}$ | 7.00 | 38 | $\frac{7}{32} \times ^{5}_{64}$ | 7.80 | 1/2 | 14X18 | 8.30 | 34 | 14x18 | 9.30 |
| 316 | 1 8 X 1 16 | 7.00 | 3/8 | 1 $_{1}$ $\times \frac{3}{32}$ | 8.00 | 1.7 | 1 4 X 3 16 | 8.20 | 3 1 3 1 4 | 1/4 X 3/16 | 8.70 |
| 14 | 1 16 X 1 16 | 7.00 | % 6 | $\frac{3}{32} \times \frac{3}{32}$ | 7.70 | 9/16 | 1/8X1/8 | 7.90 | 34 | 14X14 | 8.50 |
| 14 | 32 X 64 | 7.00 | 76 | 1/8 x 1/6 | 7.80 | 916 | 32 X 32 | 8.10 | 3/4 | .266 sq. | 8.72 |
| 14 | $_{3\frac{1}{2}}$ X $_{3\frac{1}{2}}$ | 7.20 | 7/16 7/16 7/16 7/16 7/16 | 1 8 X 35 | 7.80 | 916 | 3/6 X 1/6 | 8.00 | 34 | .280 " | 9.40 |
| 14 | 1/8 x 1/16 | 7.50 | 76 | 18x18 | 7.70 | 916 | 3/6 X 32 | 8.10 | 3/4 3/4 3/4 3/4 3/4 | 5/6 X 1/8 | 9.20 |
| $\frac{1}{4}$ | 1/8 X 32 | 7.70 | 7/16 | 32 X 16 | 7.80 | 916 | 3 ₁₆ x 1 8 | 8.10 | 34 | 5/6 x 3/6 | 8.70 |
| 34 | 32 X 16 | 7.70 | 76 | 52 X 32 | 7.80 | 16 | 316 X 316 | 8.20 | 3/4 | 56X14 | 9.40 |
| 14 | 5 X 3 3 | 7.70 | 716 | 32 X 1/8 | 7.80 | 916 | 32 X 1 8 | 8.20 | 3/4 | 3 5X1/8 | 9.80 |
| 34 | 32 X 1 8 | 7.70 | 716 716 716 716 716 716 716 | 25, X 25, | 7.80 | 916 | 1 4 X 32 | 8.40 | 3/4 | 3 x X 3 46 | 9.80 |
|). 1,4 2,4 | 3/6 X 1/6 | 7.70 | 716 | 316 X 116 | 7.80 | 916 | 1, x1 & | 8.40 | 3,3,3,1-,1-,2,3 | 38X17 | 11.00 |
| 5 16 | 1 ₁₆ x 1 ₁₆ | 7.30 | 716 | 3/6 X 32 | 7.90 | 916 | 1 4 X 3 16 | 8.20 | 3,7 | 3 8X 516 | 12.50 |
| 516 | 3 X 3 2 | 7.40 | 736 | 3/6 X 1/8 | 7.90 | 58 | 32 X 1 8 | 8.20 | 73 | .266 sq. | 9.70 |
| 516 | 1/8 x 1/6 | 7.70 | 7% | 316 X 316 | 8.00 | 5% | 35 x 35 | 8.30 | 7% | 516X14 | 10.12 |
| 516 | 1 8 x 3 2 | 7.70 | 716 216 | 32 X 16 | 7.80 | 58 58 | 3/6 X 1/6 | 8.20 | 1 " | .266 sq. | 11.00 |
| 5 16 | $\frac{5}{32}$ x $\frac{32}{16}$ | 7.70 | 716 | $\frac{32}{32}$ X $\frac{5}{64}$ | 7.90 | 53 | 316 X 35 | 8.30 | ī | 3 8x14 | 13.60 |
| 5 16 | 32 × 16 | 7.70 | 716 | 32 X 1/8 | 8.00 | 53 | 3 ₁₆ x 1 x | 8.30 | 116 | $.266 \mathrm{sq}$. | |
| 5 16 | $^{5}_{^{3}2}$ X $^{3}_{^{1}2}$ $^{5}_{^{3}2}$ X $^{1}_{^{8}}$ | 7.70 | 716 | $^{1}_{4}$ x $^{3}_{32}$ | 8.20 | 53 | 3 16 X 3 16 | 8.30 | 11/8 | 3 8 X 1 4 | 15.00 |
| 5 16 | 3 16 X 1 16 | 7.70 | 1,16 | $^{3}_{32}$ x $^{32}_{32}$ | 7.80 | 5 8 | 32 X 1 8 | 8.40 | 114 | .266 sq. | 13.00 |
| 5 16 | 316 X 32 | 7.70 | 1/2 | $\frac{32 \times 32}{18 \times 16}$ | 7.90 | 1 5 1 | $^{1}_{4}x_{1_{6}}^{3}$ | 8.20 | 114 | 3/8x14 | 18.00 |
| 5 16 16 | 316 X 1 8 | 7.70 | 72 | 1 8 X 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | 7.80 | . 8 | $^{1}_{4}$ $^{1}_{3}$ $^{1}_{2}$ | 8.50 | 13 8 | 3 x14 | 20.50 |
| 3 16 | 16 X 16 | 7.50 | 12 | 1 8 X 1/8 | 7.80 | _ 8 | $^{1}_{4}x^{1}_{8}$ | 8.50 | 11/2 | 76x14 | 32.00 |
| $\frac{3}{3}$ 8 | 76 A 76 | 7.60 | 1 72 | 78478 5 v l / | 7.80 | 5 8 5 8 | 14 X 3 16 | 8.40 | 15 8 | 7/ 7/ | 45.00 |
| 3 8 3 8 | 32 X 32 | 7.70 | 1/2 1/2 1/2 1/2 1/2 1/2 | 5 x 1 2 5 x 3 | 7.80 | 1 - 2 - 1 | 1 4 Z 1 4 | 8.30 | | 716 X 1 4 | 57.00 |
| | 1.8X 16 | 7.70 | 72 | 32 X 32 | 7.90 | . 8 | | 8.80 | $\begin{vmatrix} 1\frac{3}{4} \\ 2 \end{vmatrix}$ | 1/2 X 5/6 | 87.00 |
| . 8 1 | 1/8 X 3/2 | 7.60 | 72 | $\frac{5}{32} \times \frac{1}{8}$ | | 67 | ⁵ ₁₆ X ¹ / ₈ | 8.50 | | 2X 16 | 109.00 |
| 8 1 | 1 8 X 1 8 5 × 1/ | | 1/2 | 3 X 32 | 8.00 | | 16.4 716 | | 214 | 12 X 5 16 | 120.00 |
| 3/8 | 32 4 16 | 7.70 | 1/2 | ⁸ 16 X ¹ 16 | 7.80 | 1 . 8 | ⁵ 16 X ¹ 4 | 9.00 | 212 | 1/2 x 5 16 | |
| 38 | 32 X 32 | 7.70 | $\begin{vmatrix} \frac{1}{2} \\ \frac{1}{2} \end{vmatrix}$ | 316 X 32 | 8.00 | 5 8 | $\frac{3}{3}$ \times \times $\frac{1}{3}$ | 9.00 | $\frac{2^{3}}{2}$ | 1/2 x 5 16 | 132.00 |
| $-\frac{3}{8}$ | 32 X 1 8 | 7.70 | '2 | 3 ₁₆ X ¹ 8 | 8.00 | 1 _5 4 _ 1 | 3 8X 3 16 | 9.00 | 3 | 5 8X3 8 | 200.00 |

Special sizes made upon order. Prices on application.

SPIKES

TRACK SPIKES



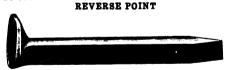


Fig. 7575A

Pig. 7575B





Pig. 7575C

RAILROAD SPIKES

| Size Under Head Inches | Average Number per Keg of 200 lbs. | Between 4 Spikes | Ties 2 Feet Reitween Centers Rail Used Weight Bylkes per Tie Weight Per Yard Pounds Rounds Weight Pounds Rail Used Weight Inches Ties 2 Feet Size Weight Under Head Pounds Rail Used Weight Pounds Rail Used Rail | | Centers per Tie | Rail Used Weight per Yard Pounds | | | |
|--|---|--|---|--|--|--|---|---|--|
| | 4% ±0 | Pounds | Kegs | , | | 72 AN | Pounds | Kegs | _ |
| 51/2 x 9/6 5 x 9/6 41/2 x 9/6 5 x 1/5 41/2 x 1/6 | 360 405 460 475 518 605 670 690 780 | 5920 5230 4606 4460 4080 3515 3180 3090 2730 | 29/3 26 23 22/5 20/6 17/2 157/8 15/2 13% | 45 to 100 40 " 56 35 " 40 35 " 40 28 " 35 24 " 35 20 " 30 20 " 30 | 31 2 x 7/6 41 2 x 3 8 4 x 3 8 31 2 x 3 8 3 x 3 8 21 2 x 3 8 21 2 x 3 8 21 2 x 5/6 21 2 x 5/6 | 890 930 1025 1250 1380 1650 1880 2230 | 2377 2530 2044 1740 1592 1280 1152 948 | 12 113 101 812 8 614 534 434 | 16 to 25 16 " 25 16 " 25 16 " 20 16 " 20 12 " 16 12 " 16 8 " 12 |

RAILROAD SPIKES-Extras Over Base

| 4½, 5 and 5½ x %-inch | Base | 21 5 x 3 4-inch | . 40 |
|---|------|--|------|
| $3\frac{1}{2}$, 4, $4\frac{1}{2}$, and 5 x $\frac{1}{2}$ -inch | . 10 | $2\frac{1}{2}$, 3, and $3\frac{1}{2}$ * 56-inch | .60 |
| $3\frac{1}{2}$, 4, and $4\frac{1}{2}$ x $\frac{7}{6}$ -inch | .20 | 2 x 5/6-inch | .80 |
| $3, 3\frac{1}{2}, 4, \text{ and } 4\frac{1}{2} \times 3_8 \text{-inch}$ | .30 | Reverse Point, Smallest, 3x3 s-inch | 14c |

NUMBER OF BOAT SPIKES TO 200 POUND KEG

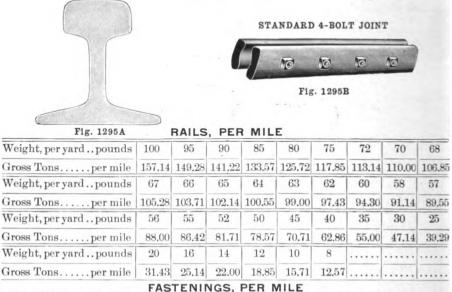
| Square Diam. | | | | | | 1 | LINGTH | i, Inchi | ES | | | | | |
|--------------------------|---------|---------|------|---------|------|------|-----------|----------|------|-----|-----------|-----|-----|-----|
| Inches | 3 | 31.2 | 4 | 41.5 | 5 | 51/2 | 6 | 7 | 8 | 9 | 10 | 12 | 14 | 16 |
| 14 | 3300 | 2880 | 2343 | 2200 | 2030 | 1828 | 1624 | 1420 | 1220 | , | · · · · · | | | |
| 516 | | | 1671 | 1364 | | 1175 | 1115 | | 849 | | | | | |
| 3 ∕8 | | | | 1039 | 935 | 880 | 710 | 665 | 602 | 519 | 468 | 410 | | |
| 716 | • • • • | | | | | | 562 | 516 | 453 | 409 | 369 | 302 | | |
| $\frac{1}{5}\frac{2}{8}$ | | 1 | | | | ' | 433 | 400 | 337 | 305 | 297 | 241 | 216 | 182 |
| | • • • • | • • • • | | | | | • • • • • | | | ••• | 182 | 155 | 130 | 122 |
| 3/4 | · | | | • • • • | | | | | | | | | 95 | 80 |

BOAT SPIKES-Extras Over Base

| 3/4- | inch | square, | 12 to 24 i | nche | s long | .15 | 3 %- | inch | square, | 4 t | o 12 i | inches | long. | .30 |
|------|------|---------|------------|------|--------|-----|------|------|---------|-----|--------|----------|-------|------|
| 5.8 | • 6 | - " | 8 to 16 | • 6 | " . | .15 | 5/6 | ** | • • • | 4 . | 8 | 44 | "". | .45 |
| 1/2 | | 46 | 6 " 16 | • 6 | ٠٠. | .15 | 14 | 44 | 4.6 | 4 " | 8 | ** | " . | . 75 |
| 7/16 | " | " | 6 " 12 | 44 | ٠٠ . | .20 | 1, | •• | ** | 3 . | 31 | <u> </u> | " . | 1.00 |

^{3/8} and 5/6-inch shorter than 4 inches, 14 cent extra.

WEIGHTS, ETC., OF STEEL RAILS, AND FASTENINGS



| FASTERINGS, FER MILE | | | | | | | | | | |
|-----------------------|----|----|-----|----|----|----|----|--|--|--|
| Length of Rail feet | 30 | 28 | 26 | 24 | 22 | 20 | 18 | | | |
| Number of Splice Bars | | | 812 | | | | | | | |

FASTENINGS PER TON OF RAIL Weight of Rail Feet of Track Joints Complete, 20-foot Rails...

| CROSS-TIES PER MILE | OF SI | INGLE | TRA | CK | | |
|------------------------|-------|-------|------|------|------|------|
| Center to Centerinches | 18 | 24 | 27 | 30 | 33 | 36 |
| Number of Ties | 3520 | 2641 | 2348 | 2113 | 1921 | 1761 |

TABLE OF CUBIC YARDS OF BALLAST PER MILE Side-slope of the Ballast 1 to 1. Width in clear between tracks of double-track road, 6 feet.

| | TOP WIDT | H, SINGLE T | RACK, FEET | TOP WIDT | TOP WIDTH, DOUBLE TRACK, FEET | | | | | | |
|---------------|------------|-------------|------------|------------|-------------------------------|------------|--|--|--|--|--|
| Depth, Inches | 10 | 11 | 12 | 21 | 22 | 23 | | | | | |
| | Cubic Yds. | Cubic Yds. | Cubic Yds. | Cubic Yds. | Cubic Yds. | Cubic Yds. | | | | | |
| 12 | 2152 | 2347 | 2543 | 4303 | 4499 | 4695 | | | | | |
| 18 | 3374 | 3667 | 3960 | 6600 | 6894 | 7188 | | | | | |
| 24 | 1941 | 5085 | 5474 | 8996 | 9388 | 9780 | | | | | |
| 30 | 1914 | 6600 | 7087 | 11490 | 18066 | 12470 | | | | | |

[&]quot;V" or saw-mill rail, state size and quantity desired.

STANDARD NAIL CARD STEEL WIRE NAILS

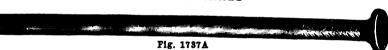


Fig. 1737A List of Extras for Steel Wire Nails

Revised Feb. 1, 1910

Price per Keg.

| Common, Fence, Shingle, Tobacco, Floo and Common Brads | ring, |
|---|-------------|
| A dve | naaa |
| 20d to 60d | Base |
| 10d to 16d | .05 |
| 8d and 9d | .10 |
| 6d " 7d | .20 |
| 4d " 5d | .30 |
| 3d | .45 |
| 2d | .70 |
| Barbed Common and Barbed Car Na | ils |
| 15 cents advance over common Casing and Smooth Box Nails | |
| 10d and larger | .15 |
| 8d " 9d | .25 |
| 6d " 7d | .35 |
| 4d " 5d | .50 |
| 3d | .70 |
| 2d | |
| Barbed Box, 15 cts. advance over Sm | ooth |
| Smooth Finishing Nails | 00011 |
| 10d and larger | .25 |
| 8d " 9d | .35 |
| 6d " 7d | .45 |
| 4d " 5d | .65 |
| 3d | .85 |
| 2d | 1.15 |
| Pine Nails | |
| 2d | 1.00 |
| 2d, extra fine, 1 x 17 | 1.10 |
| 3d, 1½ x 15 3d, extra fine, 1½ x 16 | .50 |
| Ad extra line, 1 1/8 x 10 | .65 |
| 4d | .50 |
| 2d | .80 |
| 3d | .60 |
| 4d and 5d | .40 |
| 6d | .30 |
| Hinge Nails | ,,,0 |
| 10d and larger | .50 |
| 8d | .60 |
| 6d | .70 |
| 4d | .80 |
| Boat Nails 25 cents Extra over Hinge | Naile |
| | - ********* |

| Rarral Wails | inces |
|--|-------|
| 5% inch | 1.35 |
| 34 " 78 " | 1.00 |
| 1/8 " | .85 |
| <u> </u> | .70 |
| 118 " | .60 |
| 1¼ " | .50 |
| 138 " | .40 |
| 11/2 " | .30 |
| Barbed Roofing Nails | |
| 3í inch | .75 |
| 78 "4" | .65 |
| 1 " | .60 |
| 116 " | .60 |
| 11/4 " | .55 |
| $ \begin{array}{ccccccccccccccccccccccccccccccccc$ | .45 |
| 134 " | .45 |
| 2 " " | .35 |
| Clinch Nails | .,,0 |
| | |
| Annealed or Bright | |
| 0.) | 1.05 |
| 3d | .85 |
| 4d and 5d | .65 |
| 6d " 7d | .55 |
| 8d " 9d | .45 |
| 10d to 20d | .35 |
| Spikes | |
| All sizes to 9 inches | .10 |
| 10 and larger | .25 |
| Special Gauge 10 cents additiona | l. |
| Barbed Dowel Pins | |
| $1^{1}_{4}, 1^{3}_{8}, 1^{1}_{2}$ inch | .60 |
| 1^{1} inch | .60 |
| 1 " | .70 |
| 7′ " | .85 |
| 38 4 | 1.00 |
| 58 " | 1.25 |
| | _,_, |
| Annealed Nails (except Clinch Hinge) 15 cents extra. | and |
| Blued Nails, 25 cents extra. | |

LENGTH OF NAILS

| Nails | | | | | | | | |
|------------|-------|--|------|--|---------|-------|---|-------|
| Sizeinches | 1 114 | $1^{\overline{1}}_{2}1^{\overline{3}}_{4}$ | 2 21 | $\frac{7}{4} 21\frac{7}{2} 2\frac{3}{4} -3$ | 314 312 | 4 412 | 5 | 512 6 |

CEMENT COATED NAILS

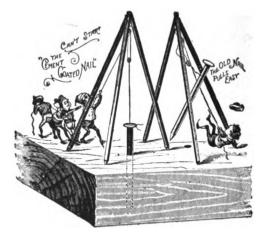


Fig. 5976A

CEMENT COATED NAILS

| Size | 60d | 50d | 40d | 30d | 20d | 16d | 12d | 10d |
|---|------|------|------|----------------------|-----|---------------------|---------------------|---------------------|
| Number Coated Nails in Keg "Smooth "" Advance over Base | 1100 | 1300 | 1800 | 2400 2400 Base | | 4900 4900 .05 | 6200 6200 .05 | 6600 6600 .05 |
| Size | 9d | 8d | 7d | 6d | 5d | 4d | 3d | 2d |
| Number Coated Nails in Keg "Smooth " " " | | | | | | | | |
| Advance over Base | | | .20 | | .30 | | .45 | .70 |

Cement Coated Nails are NOT sold by weight. The count is guaranteed to be at least equal to that of common Standard Wire Nails, as furnished in one hundred pound kegs.

BASE PRICE, PER KEG

Manufacturers are prepared to furnish to order, Cement Coated substitutes for all Nails on the Standard lists, on Nails having such special features as can be made in Wire.

Cement Coated Nails are made with great care and are suitable for either Machine or hand driving.

LENGTH OF NAILS

| Nails 2d | 3d 4d 5d 6 | d 7d 8d 9d 10d | 12d 16d 20d | 30d 40d 50d 60d |
|--------------|---------------|--|-----------------|-----------------|
| Sizeinches 1 | 114 112 134 2 | $2 2\frac{1}{4} 2\frac{1}{2} 2\frac{3}{4} 3$ | 314 31/2 4 | 41/2 5 51/2 6 |

STEEL FASTENERS AND ESCUTCHEON PINS

CORRUGATED STEEL FASTENERS



No. 2 No. 3 No. 4 No. 5

Fig. 2503B Price per Thousand

| No. | | DEPTH, INCHES | | | | | | | | | | | | | |
|------|------|---------------|------|------|------|------|------|--|--|--|--|--|--|--|--|
| 110. | 1/4 | 8/8 | 1/2 | 5/8 | 3/4 | 7/8 | 1 | | | | | | | | |
| 2 | .45 | .55 | .60 | . 80 | . 90 | 1.00 | 1.15 | | | | | | | | |
| 3 | .60 | .75 | . 85 | 1.00 | 1.15 | 1.35 | 1.45 | | | | | | | | |
| 4 | . 75 | .95 | 1.05 | 1.30 | 1.45 | 1.75 | 1.85 | | | | | | | | |
| 5 | .90 | 1.20 | 1.30 | 1.70 | 1.85 | 2.20 | 2.40 | | | | | | | | |
| 6 | 1.10 | 1.40 | 1.50 | 1.85 | 2.15 | 2.55 | 2.85 | | | | | | | | |
| 7 | 1.30 | 1.60 | 1.80 | 2.20 | 2.50 | 3.00 | 3.35 | | | | | | | | |
| 8 | 1.50 | 1.80 | 2.10 | 2.55 | 2.90 | 3.45 | 3.85 | | | | | | | | |
| 9 | 1.75 | 2.00 | 2.40 | 2.90 | 3.20 | 3.65 | 4.10 | | | | | | | | |
| 10 | 2.00 | 2.20 | 2.70 | 3.15 | 3.55 | 3.90 | 4.35 | | | | | | | | |
| 11 | 2.20 | 2.40 | 2.85 | 3.30 | 3.75 | 4.15 | 4.65 | | | | | | | | |

Packages contain 1000 Fasteners each, with the exceptions of the larger sizes, which contain 500 each. In ordering give depth and number, as: 1/4-inch No. 2, etc.

BRASS ESCUTCHEON PINS



In Pound Packages. Price per Pound

| Wire Nos | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 |
|---|------|------|------|------|------|-----|-----|-----|-----|
| 3/6 inch | 1.55 | 1,35 | 1.20 | 1.10 | 1.00 | .95 | .90 | | |
| 1/4 " | 1,35 | 1.20 | 1.10 | 1.00 | .90 | .85 | .83 | | |
| 14 " 36 " 72 " 73 " 74 " 75 " 76 " 77 " | 1.25 | 1.15 | 1.00 | .92 | .85 | .82 | .80 | .78 | .77 |
| 1/2 " | 1.20 | 1.10 | .96 | .89 | .82 | .78 | .77 | .76 | .75 |
| 5% " | 1.15 | 1.05 | .94 | .87 | .80 | .77 | .76 | .75 | .74 |
| 34 " | 1.10 | 1.00 | .92 | .85 | .78 | .76 | .75 | .74 | .73 |
| 3/8 " | 1.10 | 1.00 | .90 | .83 | .76 | .75 | .74 | .73 | .72 |
| " | 1.15 | 1.03 | .90 | .81 | .75 | .74 | .73 | .72 | .73 |
| | 1.15 | 1.03 | .92 | .80 | .74 | .72 | .71 | .70 | .69 |
| 11/4 " 11/4 " 13/4 " | | 1.05 | .92 | .80 | .74 | .72 | .70 | .69 | .68 |
| 34 " | | | .93 | .81 | .74 | .72 | .70 | .69 | .67 |
| 2 " | | | .95 | .82 | .75 | .72 | .70 | .69 | .6" |

RIVETS

ANY STYLE HEAD

PLAT COUNTERSUNK RUNG STEEPLE CONE WAGON BOX OVAL TRUSS HOOF HEAD HEAD HEAD HEAD HEAD HEAD HEAD HEAD Pig. 217A Pig. 217B Fig. 217D Fig. 217F Pig. 2171

Price per Pound in 5 and 10 Pounds Boxes
Adopted Jan. 8, 1904. Revised May, 1906

| Size | Length, Inches | | | | | | | | | | | | | | | | | |
|----------------------|--------------------|---------------------------------|---------------------------------|----------|----------|-------|------|-------|-----|-------|------|------|-----|------|-----|------|-----|------|
| Wire | 1 and longer | 7/8 | 3/4 | 5/8 | 1/2 | 15/32 | 7/16 | 13/32 | 3/8 | 11/32 | 5/16 | 9/32 | 1/4 | 7/32 | 3/6 | 5/32 | 1/8 | 3/32 |
| 7/16 3/8 11/32 | 19 19 | 191/2 | 191/2 | 20 20 | 20 20 | 21 | | | | | | | | | | | | |
| 11/20 | 191/2 | $\frac{19\frac{1}{2}}{20}$ | $\frac{19\frac{1}{2}}{20}$ | 201/2 | | | 21 | | | | | | | | | | | |
| 5/16 | 1912 | 20 | 20 | 201/2 | 201/2 | 21 | 22 | 22 | 22 | | | | :: | | | | :: | |
| 16 | 20 | 201/2 | | 21 | 21 | 22 | 23 | 23 | 23 | 23 | | 1: | | 1 | | | 1.0 | |
| 2 | 20 | 201% | $20\frac{1}{2}$ | 21 | 21 | 22 | 23 | 23 | 23 | 23 | 24 | | | 1 | | | | |
| 3 | 20 | 201% | 201/2 | 21 | 21 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | | | | | |
| 1/4 | 20 | 201% | 201/2 | 21 | 21 | 22 | 23 | 23 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | | | |
| 4 | 21 | 211/2 | 211/2 | 22 | 22 | 23 | 23 | 24 | 24 | 24 | 24 | 24 | 24 | 25 | 25 | 26 | | |
| 1/4 4 5 | 21 | 21% | 21% | 22 | 22 | 23 | 24 | 24 | 24 | 24 | 25 | 26 | 26 | 27 | 27 | 28 | 28 | 29 |
| 6 | 21 | 211/2 | $21\frac{1}{2}$ $21\frac{1}{2}$ | 22 | 22 | 23 | 24 | 24 | 25 | 25 | 26 | 26 | 27 | 28 | 29 | 29 | 29 | 30 |
| 716 | 21 | $21\frac{1}{2}$ | 211/2 | 22 | 22 | 23 | 24 | 24 | 25 | 25 | 26 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 7 | 21 | $21\frac{1}{2}$ | 22 | 23 | 23 | 24 | 24 | 24 | 25 | 25 | 26 | 26 | 27 | 28 | 29 | 30 | 31 | 32 |
| 8 | 22 | $22\frac{1}{6}$ | 221/2 | 23 | 23 | 24 | 25 | 25 | 26 | 26 | 27 | 27 | 28 | 29 | 30 | 31 | 32 | 33 |
| 9 | 23 | $23\frac{1}{2}$ | 231/2 | 24 | 24 | 25 | 26 | 26 | 27 | 27 | 29 | 29 | 29 | 30 | 31 | 33 | 35 | 36 |
| .0 | 24 | 241/2 | 241/2 | 25 | 25 | 26 | 27 | 28 | 29 | 31 | 33 | 34 | 34 | 36 | 39 | 41 | 43 | 44 |
| 1 | 25 | $25\frac{1}{2}$ $26\frac{1}{2}$ | $25\frac{1}{2}$ | | 26 | 28 | 30 | 32 | 33 | 34 | 36 | 37 | 37 | 39 | 43 | 46 | 48 | 51 |
| 12 | 26 | $26\frac{1}{2}$ | $26\frac{1}{2}$ | 27 | 27 | 30 | 32 | 34 | 35 | 36 | 38 | 40 | 41 | 42 | 47 | 51 | 56 | 61 |
| 13 | 30 | $30\frac{1}{6}$ | 301% | 31 | 31 | 33 | 36 | 39 | 40 | 41 | 43 | 45 | 46 | 47 | 51 | 56 | 61 | 66 |
| 14 | 32 | $32\frac{1}{2}$ | 321/2 | 33 | 33 | 36 | 41 | 44 | 46 | 51 | 56 | 58 | 61 | 64 | 64 | 66 | 69 | 7 |

Rivets made from smaller wire than No. 14, all lengths, list 80 cents per pound; $\%_{32}$ -inch diameter, list price of No. 13; $\%_{32}$ -inch diameter, list price of No. 5; $\%_{32}$ -inch diameter, list price No. 11; $\%_{32}$ -inch diameter, list price No. 2.

LIST EXTRAS.—For Shoulder and Pointed Rivets, add 2 cents per pound to list price for each specialty, except Pointed Hame. Intermediate lengths and diameters, list prices of nearest smaller size.

NET EXTRAS. -For Tinning or Copper Plating, add 1 cent per pound to net price; for Metallic Tinning, add 3½ cents per pound to net price.

LIST REBATES.—For 25 and 50-pound boxes, deduct 2 cents per pound from list price; for 100 and 200-pound kegs, deduct 4 cents per pound from list price

BOILER AND STRUCTURAL RIVETS

CONE HEAD





BUTTON HEAD



Fig. 5569A Fig. 5569B

AVERAGE NUMBER OF CONE HEAD RIVETS OF ENUMERATED SIZES IN 100 POUNDS

| gth | | 1 | DIAMET | ER, IN | CHES | | | gth | | | DIAME | TER, I | NCHES | | |
|------------|-------|-------|--------|--------|-------|-----|-----|------------------|-----|-----|-------|--------|-------|------|-----|
| Length | 3/8 | 7/6 | 1/2 | 5/8 | 11/16 | 3/4 | 7/8 | Length Inches | 3/8 | 7/6 | 1/2 | 5/8 | 11/16 | 3/4 | 7/8 |
| 3/4 7/8 | 2,373 | 1,476 | 1,103 | 642 | | | | 31/2 | 837 | 548 | 433 | 270 | 208 | 177 | 126 |
| 7/8 | 2,190 | 1,371 | 1,030 | 604 | | | | 334 | 791 | 519 | 411 | 257 | 198 | 168 | 120 |
| 1 | 2,034 | 1,280 | 968 | 571 | 400 | 345 | | 4 | 749 | 490 | 390 | 244 | 189 | 161 | 115 |
| 11/8 | 1,898 | 1,200 | 910 | 541 | 382 | 322 | | 41/4 | | | 372 | 233 | 180 | 155 | 110 |
| 11/4 | 1,780 | 1,129 | 862 | 514 | 365 | 311 | | 41/2 | | | 355 | 223 | 172 | 149 | 105 |
| 13/8 | 1,675 | 1,066 | 815 | 489 | 350 | 295 | | 434 | | | 339 | 214 | 166 | 143 | 101 |
| 11/2 | 1,582 | 1,010 | 776 | 462 | 335 | 284 | 201 | 5 | | | 325 | 205 | 160 | 136 | 97 |
| 15/8 | 1,498 | 960 | 740 | 446 | 324 | 275 | 199 | 51/4 | | | 312 | 197 | 154 | 131 | 94 |
| 134 | 1,424 | 914 | 707 | 428 | 311 | 266 | 192 | 51/2 | | | 300 | 190 | 149 | 127 | 91 |
| 17/8 | 1,356 | 872 | 672 | 411 | 302 | 257 | 185 | 534 | | | 289 | 183 | 144 | 123 | 88 |
| 2 | 1,295 | 834 | 648 | 395 | 293 | 249 | 178 | 6 | | | 279 | 177 | 139 | 118 | 85 |
| 21/8 | 1,238 | 800 | 623 | 381 | 285 | 240 | 172 | 61/4 | | | | 171 | 135 | 114 | 82 |
| 21/4 | 1,187 | 768 | 599 | 367 | 277 | 233 | 167 | 61/2 | | | | 165 | 131 | 110 | 79 |
| 23/8 | 1,139 | 738 | 577 | 354 | 269 | 226 | 162 | 634 | | | | 160 | 127 | 107 | 77 |
| 21/2 | 1,095 | 711 | 556 | 343 | 261 | 219 | 157 | 7 | | | | 155 | 123 | 104 | 75 |
| 25/8 | 1,052 | 687 | 537 | 332 | 253 | 212 | 152 | 71/4 | | | | 150 | 119 | -100 | 73 |
| 23/4 | 1,017 | 662 | 519 | 321 | 245 | 206 | 148 | 71/2 | | | | 146 | 116 | 97 | 71 |
| 27/8 | 982 | 636 | 503 | 311 | 237 | 201 | 144 | 734 | | | | 142 | 113 | 94 | 69 |
| 3 | 949 | 611 | 487 | 302 | 230 | 196 | 140 | 8 | | | | 138 | 110 | 92 | 67 |
| 31/4 | 890 | 581 | 459 | 285 | 218 | 186 | 132 | | | | | | | | |

STANDARD LIST OF EXTRAS

On Boiler and Structural Rivets. In Keys Weighing 200 to 300 Pounds

| Cone Head Boiler Rivets, 3/4 to 11/4-inch diameter, inclusive | Raca |
|---|------|
| Othe Head Bone Invets, 74 to 174 mon diameter, inclusive | Dase |
| Button Head Structural Rivets, 3/4 to 11/4 inch diameter, inclusive | Base |
| | |

EXTRAS PER 100 POUNDS

| ½-inch diameter | .50 |
|--|------|
| 92 " " | .50 |
| % and %-inch diameter | .15 |
| Lengths shorter than one inch | .50 |
| Countersunk Heads, in quantities under 1000 pounds of a diameter | . 25 |
| Flat Head Rivets in quantities under 1000 pounds of one size | 25 |
| Rivets packed in 100-pound kegs | .10 |
| Items under 100 pounds of a size | .50 |
| | |

Special heads and diameters other than enumerated above, to be charged for at extra price at the discretion of the maker.



COOPERS, RIVETS REVISED LIST MAY, 1906

Fig. 7989A

COOPERS'

Fig. 7989B

| Size pound | 1 | 2 | 3 | 4 | 5 | 6 |
|---|--------------------------------|----------|--|----------|-----------|-----------|
| Length inches Diameter number Price, 5 and 10 pound boxes per pound | $\frac{\frac{13}{32}}{4}$. 21 | 3 20½ | $\begin{array}{r} \frac{15}{32} \\ 2 \\ .20 \end{array}$ | 1 .20 | .0 .20 | 00 .20 |

HAME

| Number | | | | 6 | 316 | 7 | 8 |
|----------|------|------|-----------|--------|--------|--------|-------|
| Price, 1 | inch | Long | per pound | .21 | .21 | .21 | .21 |
| " 7/8 | " | " | | .211/2 | .211/2 | .211/2 | .2114 |
| " ¾ | " | " | | .211/2 | .211/2 | .22 | .22 |
| " 5/8 | | " | | .22 | .22 | .23 | .23 |

List rebates on Coopers' and Hame rivets, 2 cents per pound in 25 and 50-pound boxes and 4 cents per pound in 100 and 200-pound kegs.

BELT RIVETS AND BURRS









Fig. 7989C

Fig. 7989D

BELT RIVETS AND BURRS

| Number | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|------|-----|------|-----|-----|------|-----|------|
| Price, Uniform Lengths in 1-pound | | | | | | | | |
| boxes, any length,per pound | .35 | .36 | . 37 | .39 | .41 | .45 | .48 | .51 |
| Price, Uniform Lengths in ½-pound | 1 | ĺ | | 1 | ł | ŀ | | |
| boxes, any length," | .39 | .40 | .41 | .43 | .45 | .49 | .52 | .55 |
| Price, Uniform Lengths, in 1/4-pound | i | i | l | ĺ | i | | 1 | 1 |
| boxes, any length," | . 43 | .44 | .45 | .47 | .49 | . 53 | .56 | .59 |
| Price, Assorted Lengths, 3/8 to 3/4- | | ļ | | | l | 1 | 1 | İ |
| inch in 1 pound boxes " | .39 | .40 | .41 | .43 | .45 | .49 | .52 | . 55 |
| Price, Assorted Lengths, in 3/8 to 3/4- | | 1 | ŀ | ŀ | l | | | |
| inch in ½-pound boxes " | .43 | .44 | . 45 | .47 | .49 | . 53 | .56 | .59 |

Tinned or coppered, same price.

BLACK IRON BURRS

| Size | 3/8 | $\frac{11}{32}$ | 5/6 | 1 | 2 | 3 | 1/4 | 4 | 5 | 6 |
|----------------|------|-----------------|------|-----|-----|------|-----|-----|-----|-----|
| Priceper pound | .36 | .36 | . 36 | .36 | .36 | . 36 | .36 | .37 | .38 | .42 |
| Size | 3/16 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| Priceper pound | .42 | .43 | .44 | .45 | .47 | . 50 | .60 | .70 | .80 | |

Net Extras—For metallic tinning, add $3\frac{1}{2}$ cents per pound, and for coppering or tin plating, add 1 cent per pound. List Rebates—For 25 and 50-pound boxes, deduct 2 cents per pound and for 100-pound kegs deduct 4 cents per pound.

SPRING COTTERS AND FLAT SPRING KEYS

SPRING COTTER

PLAT SPRING KEY





Fig. 481A

Adopted Jan. 1, 1906

Fig. 481B

SPRING COTTERS-Price per Thousand

| Wire | Gauge | 13 | 1 | 12 | 1 | 1 | 1 | LO | | 9 | 1 | 8 | | 7 | | (| 3 | 1 | 5 | 4 | | 1 | | | | | | | | | |
|--------|--------|-------------|-----|------|-----|-----------------|----|------|----|----------|-----|----------|-----|-----|----------|-----------------|-----|----------|-----|------|---|----------------|----|---------------------|----|------|----|-------|----|-----|-------|
| Dian | n. in. | 3 3 2 | 1 | 7.54 | 1 | 8 | 1 | 9 34 | 1 | 5 3 2 | - | 11 64 | | 3/1 | 6 | 16 | 34 | 3 | 7 2 | 1/4 | | 5/16 | 3 | 8 | 3 | 16 | | 1/2 | | 5 | 8 |
| | | 3.50 4.1 | | | | | | .00 | | 7.00 |) 8 | 3.0 | 0. | 1. | i. | 12 | .00 | | | | | | | | | | | | | | |
| | 1 | 4.8 | 05 | .50 | 6. | 70 | 8 | .00 | 6 | 30 | 1(| 0.6 | 0 1 | 2. | 80 | 14 | .00 | 18 | .00 | 20.0 | O | 32.50 | | | | | | | | | |
| | 114 | 5.4 | 56 | .25 | 7. | 55 | 9 | .00 | 10 | 0.45 | 1 | 1.9 | 01 | 4. | 50 | 16 | .00 | 20 | .80 | 23.5 | 0 | 37.50 | | | | | | | | | |
| es | 13/ | 6.7 | 5 7 | .00 | 9 | $\frac{40}{25}$ | 11 | 00. | 19 | 2.75 | 114 | 1.5 | 011 | 7. | 20 90 | $\frac{18}{20}$ | 00. | 23 26 | .60 | 30.5 | 0 | 42.50 47.50 | 79 | $\frac{2.00}{2.20}$ | 10 | 8.00 | | • • • | ٠. | ٠ | • • • |
| nches | 2 | 7.40 |)8 | .50 | 10. | .10 | 12 | .00 | 13 | 3.90 | 1: | 5.8 | 01 | 9. | 60 | 22 | .00 | 29 | .20 | 34.0 | 0 | 52.50 | 86 | 3.40 | 11 | 9.50 | 1 | 48. | 50 | | |
| = | | | | | | | | | | | | | | | | | | | | | | 57.50 | | | | | | | | | |
| th, | | | | | | | | | | | | | | | | | | | | | | 62.50 67.50 | | | | | | | | | |
| Length | 3 | | | | | | | | | | | | | | | | | | | | | 72.50 | | | | | | | | | |
| ŭ | | | | | | | | | | | | | | | | | | | | | | 77.50 | | | | | | | | | |
| | 31/2 | | | | | | | | | | | | | | | | | | | | | 82.50 | | | | | | | | | |
| | 334 | | | | | | | | | | | | | | | | | | | | | 87.50 92.50 | | | | | | | | | |
| | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6 | | ١., | | | | | | | | | | | | | | | | | | | | | | | | 38 | 38.5 | 50 | 644 | 4.00 |

CELLAR BOX COTTERS-Price per Thousand

| Diam | eter. | | inches | 3/8 | 7/16 | 1/2 | 9/16 | 5/8 | 3/4 |
|------|---------|------|--------|--------|---------|---------|---------|---------|---------|
| Leng | th 3 in | nche | s | | | | | | 900.00 |
| 66 | 4 | 44 | | | | | | | 1068.00 |
| 66 | 5 | 66 | | | | | | | 1236.00 |
| 66 | 6 | " | | | | | | | 1404.00 |
| 66 | 7 | 44 | | 412.03 | 628.00 | 796.00 | 852.00 | 960.00 | 1572.00 |
| 64 | 8 | ** | | 454.00 | 689.00 | 887.00 | 948.07 | 1080.00 | 1740.00 |
| 44 | 9 | 66 | | 496.00 | 750.00 | 958.00 | 1044.00 | 1200.00 | 1908.00 |
| 66 | 10 | 66 | | 538.00 | 811.00 | 1039.00 | 1140.00 | 1320.00 | 2076.00 |
| 46 | 11 | 44 | | 580.00 | 872.00 | 1120.00 | 1236.00 | 1440.00 | 2244.00 |
| 44 | 12 | " | | 622.00 | 933.00 | 1201.00 | 1332.00 | 1560.00 | 2412.00 |
| 66 | 13 | 66 | | 664.00 | 994.00 | 1282.00 | 1428.00 | 1680.00 | 2580.00 |
| 44 | 14 | 66 | | 706.00 | 1055.00 | 1363.00 | 1524.00 | 1800.00 | 2748.00 |
| 44 | 15 | . 66 | | 748.00 | 1116.00 | 1444.00 | 1620.00 | 1920.00 | 2916.00 |
| 66 | 16 | 66 | | 790.00 | 1177.00 | 1525.00 | 1716.00 | 2040.00 | 3084.00 |
| | 17 | 66 | | 832.00 | 1238.00 | 1606.00 | 1812.00 | 2160.00 | 3252.00 |
| " | 18 | ** | | 876.00 | 1299.00 | 1687.00 | 1908.00 | 2280.00 | 3420.00 |

FLAT SPRING KEYS-Price per Thousand

| Lengthinches | 11/4 | 11/2 | 134 | 2 | 214 | 2½ | 234 | 3 | 31/4 | 3½ |
|--------------------|-------|-------|-------|--------|--------|--------|--------|--------------------------|--------|--------|
| | 52.00 | 58.00 | 64.00 | 70.00 | 76.00 | 82.00 | 88.00 | 77.50 94.00 110.50 | | |
| # 3 ³ # | | | | 104.00 | 111.00 | 118.00 | 125.00 | 132.00 | 139.00 | 146.00 |

STANDARD TAPER PINS



Fig. 9902A
Price per Hundred

| Nu | mber | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------------|---------------------------------|---------|-----------|---------------|---------|------|------|------|------|---|------------|------------|
| Dia | meter Large Endinches | .156 | .172 | .193 | .219 | .250 | .289 | .341 | .409 | .492 | .591 | .706 |
| App | proximate Fractional izesinches | 825 | 11 | 18 | 372 | 14 | 1 9 | 112 | 13 | 1/2 | 1 9 3 2 | 2 n 8 2 |
| | ¼ | 1.80 | 2.00 | 2.10 | 2.30 | 2.50 | 2.75 | 3.00 | | | | |
| | 1 | 2.05 | 2.25 | 2.35 | 2.55 | 2.75 | 3.00 | 3.25 | 3.75 | | | |
| | 1½ | 2.30 | 2.50 | 2.60 | 2.80 | 3.00 | 3.25 | 3.50 | 4.00 | 4.65 | | |
| | 1½ | 2.55 | 2.75 | 2.85 | 3.05 | 3,25 | 3.50 | 3.75 | 4.25 | 5.00 | 7.00 | 9.00 |
| | 13/4 | 2.80 | 3 00 | 3.10 | 3.30 | 3.50 | 3.75 | 4.00 | 4.50 | 5.40 | 7.50 | 9.50 |
| | 2 | ••• | 3.25 | 3,35 | 3,55 | 3.75 | 4.05 | 4.35 | 4.75 | 5.80 | 8.00 | 10.00 |
| | 2^{1}_{24} | • • • • | | 3.60 | 3.80 | 4.00 | 4.40 | 4.75 | 5.25 | 6.25 | 8.60 | 10.75 |
| | $2\frac{1}{2}$ | | | | 4.05 | 4.25 | 4.75 | 5.20 | 5.75 | 6.75 | 9.20 | 11.50 |
| | $2\frac{3}{4}$ | | | | 4.30 | 4.50 | 5.10 | 5.70 | 6.25 | 7.25 | 9.80 | 12.25 |
| Length, Inches | 3 | | | | 4.55 | 4.75 | 5.45 | 6.25 | 6.75 | 7.80 | 10.50 | 13.25 |
| Inc | $3\frac{1}{4}$ | | | | | | •••• | 6.75 | 7.25 | 8.40 | 11.20 | 14.25 |
| t, | $3\frac{1}{2}$ | •••• | | •••• | | | | 7.25 | 7.75 | 9.00 | 11.90 | 15.25 |
| de l' | $3\frac{3}{4}$ | ••• | | | | | | 7.75 | 8.25 | 9.60 | 12.60 | 16.25 |
| ı | 4 | | | | | | | 8.25 | 8.75 | 10.20 | 13.30 | 17.25 |
| ļ | $4^{17}_{/4}$ | | | | | •••• | | | | 10.80 | 14.00 | 18.25 |
| | 41,2 | | | | | | | | | 11.40 | 14.70 | 19.25 |
| | $4\frac{3}{4}$ | | · • • • · | • • • • | | •••• | | | | | 15.40 | 20.25 |
| i | 5 | | | | • • • • | •••• | •••• | | | · • • • • • • • • • • • • • • • • • • • | 16.10 | 21,25 |
| | 5!4 | | | | | •••• | | | | | 16.80 | 22.25 |
| İ | 5½ | | | | | | | | | | | 23.25 |
| i | 5^{3}_{4} | | | | | | | | | <u> </u> | | 24.25 |
| | 6 | | | • • • • • | | ! | | | | | | 25.25 |

Taper 14-inch to the foot. If ordering sizes other than those included in the above list, furnish the length and the size at the larger end.

BRASS AND COPPER WIRE



Fig. 1036A WIRE IN COILS

| Brown and Sharpe's Gauge the Standard | Common High Brass | Low Brass | Gilding, Bronze and Copper |
|---------------------------------------|----------------------|------------------|-------------------------------|
| All Numbers to Number 10 inclusive | .23 | :27 | .28 |
| Above Number 10 to Number 16 | .2314 | $.27\frac{1}{2}$ | .281/2 |
| Numbers 17 and 18 | .24 | .28 | .32 |
| " 19 and 20 | .25 | .29 | .33 |
| Number 21 | .26 | .30 | .34 |
| " 22 | .27 | .31 | .35 |
| " 23, | .28 | .32 | .36 |
| " 21 | .30 | .34 | .38 |
| <u>" 25</u> | .32 | .36 | .40 |
| " 26 | .35 | .39 | .43 |
| " 27 | .38 | .42 | .46 |
| <u>"</u> 28 | .42 | .46 | .51 |
| " 29 | .45 | .49 | .54 |
| " 30 | .48 | .52 | .62 |
| " 31 | .51 | .55 | .67 |
| <u>" 32</u> | .55 | .59 | .73 |
| " 33 | .59 | .63 | .82 |
| <u>" 34</u> | .64 | .68 | .95 |
| " 35 | .70 | .74 | 1.30 |
| " 36 | .76 | .80 | 1.50 |
| <u>"</u> 37 | 1.00 | 1.04 | 1.70 |
| " 38 | 1.30 | 1.34 | 2.00 |
| " 39 | 2.00 | 2.00 | 3.25 |
| " 40 | 2.60 | 2.60 | 5.75 |

Prices are for 100 pounds or more of wire in coils in one order.

ADVANCES

Spring wire, 2 cents per pound. Whitened wire, 3 cents per pound. Flat, square, and half-round wire, 4 cents advance per pound on round wire, gauged the thin way after finishing.

Fancy wire not less than 10 cents advance per pound on round wire.

Wire straightened and cut, No. 12 and smaller, 12 cents per pound; same additions for cutting to length, when under 2 feet, as rods.

All wire between gauges takes price of next smaller gauge.

Wire in coils, 3 pounds and under, the same extras as spooling wire of corresponding weights.

| | | | _ | | | | | | _ | |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| On Spoolspound | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Price per pound | .12 | .11 | .10 | .09 | .08 | .07 | .06 | .05 | .04 | .03 |

Less than 1-pound spools, 24 cents per pound.

BUNDLING WIRE SHINGLE BANDS, ETC.

BUNDLING OR FENCE WIRE BRIGHT, ANNEALED, COPPERED, LIQUORED OR GALVANIZED MARKET WIRE

| Gauge No | 0000 to 9 | 10 and 11 | 12 | 13 and 14 | 15 and 16 | 17 | 18 |
|----------------|-----------|-----------|--------|------------------|-----------|-----|--------|
| Priceper pound | .10 | .11 | .111/2 | $.12\frac{1}{2}$ | .14 | .15 | .16 |
| " Tinned " | .15 | .16 | .17 | .17 | .171/2 | .18 | .181/2 |

STONE WIRE

| | | <u> </u> | | | | | | | | | |
|---------------------------|-------------|------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Gauge No | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| Priceper pound "Tinned" | .14 .17½ | .15 .18 | .16 .18½ | .19 .19 | .20 .19 | .21 .20 | .22 .20 | .23 .21 | .24 .21 | .25 .22 | .26 .23 |
| Gauge No | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 |
| Price per pound "Tinned " | .28 .24 | .29 .25 | .30 .26 | .32 | .33 .28 | .35 .32 | .37 .33 | .40 .34 | .45 .40 | .55 .48 | .40 .58 |
| Gauge No | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | |
| Priceper pound "Tinned" | .45 .70 | .50 .85 | 1.05 | .60 | .65 | .75 | .85 | 1.00 | 1.15 | 1.40 | |

CAST STEEL WIRE

| Gauge No | 1∕2 in. to 6 | 7 to 9 | 10 and 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|-----------------|--------------|--------|-----------|-----|-----|-----|------|------|------|
| Priceper pound | .23 | .24 | .25 | .26 | .28 | .30 | .32 | .33 | .34 |
| Gauge No | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| Price per pound | .36 | .38 | .40 | .50 | .60 | .75 | 1.00 | 1.25 | 1.50 |

Market Wire is furnished in sizes No. 18 and coarser. Stone Wire is not furnished in sizes coarser than No. 16. Standard weight of bundles: Market Wire, 100 pounds; Stone Wire, 12 pounds.

STRAIGHTENING AND CUTTING WIRE

| Gauge No | 00000 to 5 | 6 to 9 | 10 and 11 | 12 to 16 | 17 to 20 |
|----------------|------------|--------|-----------|----------|----------|
| Priceper pound | .01 | .02 | .03 | .04 | .05 |

SHINGLE AND HEADING BANDS

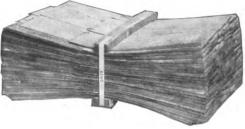


Fig. 7473A

Shingle and Heading Bands are made from a soft steel wire rolled flat. Have round smooth edges. Uniform in width and thickness. Grain of the steel is straight so they do not break or wear. Run nearly twice as many per pound as bands cut from scrap sheet iron.

Can furnish them in barrel lots, ton lots, car lots or cargoes. Prices on application.



SMOOTH STEEL WIRES

| Cuts Showing exact sizes of No. 1 to No. 20 Gauge, Steel Wire, by American Steel & Wire Company Gauge | Gauge | Pounds to 1 Mile | Feet to 1 Pound | Annealed Plain Fence Wire Price per 1b. | Galvanized Plain Fence Wire Price per 1b. |
|---|-------|------------------------|-----------------------|--|--|
| | 1 | 1128 | 4.71 | .10 | .10 |
| | 2 | 970 | 5.4 5 | .10 | .10 |
| | 3 | 836 | 6.34 | .10 | .10 |
| | 4 | 715 | 7,47 | .10 | .10 |
| | 5 | 603 | 8.81 | .10 | .10 |
| | 6 | 519 | 10.28 | .10 | .10 |
| | 7 | 441 | 12.05 | .10 | •10 |
| | 8 | 370 | 14.37 | .10 | .10 |
| | 9 | 310 | 17.24 | .10 | .10 |
| | 10 | 2 57 | 20.70 | .11 | .11 |
| | 11 | 205 | 26.18 | .11 | .11 |
| | 12 | 157 | 34.25 | .11½ | .11½ |
| | 13 | 118 | 44.64 | .12½ | .12½ |
| | 14 | 90 | 59.17 | .12½ | .12½ |
| | 15 | 73 | 73. 00 | .14 | .14 |
| | 16 | 55 | 95.24 | .14 | .14 |
| | 17 | 41 | 129.87 | .15 | .15 |
| | 18 | 32 | 172.11 | .16 | .16 |
| | 19 | 24 | 222.22 | | •••• |
| Fig. 7081A | 20 | 17 | 312,50 | | •••• |

ADVANCES PER 100 POUNDS ON SMOOTH FENCE WIRE

| Number | 9 and Coarser | 10 | 11 | 12 and $12\frac{1}{2}$ | 13 | 14 | 15 16 | 17 | 18 |
|----------|---------------|-----|------------|--------------------------|----|----|---------|----|----|
| Annealed | | .05 | .10 .30 | | | | .45 .56 | | |

Even weight bundles of 75 pounds and upward, 5 cents per bundle extra, except 100 pound bundles, which are considered standard and take no extra charge.

DIFFERENT STANDARDS FOR WIRE GAUGE IN USE IN THE UNITED STATES

DIMENSIONS OF SIZES IN DECIMAL PARTS OF AN INCH

| Number of Wire Gauge | American or Brown & Sharpe | Birmingham or Stubs' Wire | Washburn & Moen Mfg. Co. | Imperial Wire Gauge | Stubs' Steel Wire | U.S. Stand- ard for Plate | Number of Wire Gauge |
|--------------------------------------|----------------------------------|---------------------------------|--------------------------------|------------------------|----------------------|------------------------------|---------------------------------|
| 000000 | | | | . 464 | | .46875 | 000000 |
| 00000 | | | l | . 432 | | . 4375 | 00000 |
| 0000 | . 46 | . 454 | .3938 | .400 | ١ | . 40625 | 0000 |
| 000 | . 40964 | .425 | . 3625 | .372 | | .375 | 000 |
| 00 | .3648 | .38 | .3310 | .348 | | .34375 | 00 |
| 0 | .32486 | . 34 | .3065 | .324 | | .3125 | 0 |
| 1 | . 2893 | .3 | .2830 | .300 | . 227 | . 28125 | 1 |
| 2 | . 25763 | . 284 | . 2625 | . 276 | . 219 | . 265625 | 2 |
| 3 | . 22942 | . 259 | . 2437 | . 252 | . 212 | .25 | 3 |
| 2 3 4 5 6 7 8 9 | . 20431 | . 238 | . 2253 | . 232 | . 207 | . 234375 | 2 3 4 5 6 7 8 |
| 5 | . 18194 | . 22 | . 2070 | .212 | . 204 | . 21875 | 5 |
| 6 | .16202 | .203 | . 1920 | .192 | . 201 | . 203125 | 6 |
| 7 | .14428 | .18 | . 1770 | .176 | . 199 | . 1875 | 7 |
| 8 | .12849 | .165 | .1620 | .160 | . 197 | . 171875 | 8 |
| 9 | .11443 | .148 | . 1483 | .144 | . 194 | . 15625 | 9 |
| 10 | .10189 | .134 | . 1350 | .128 | . 191 | .140625 | 10 |
| 11 | .090742 | .12 | . 1205 | .116 | .188 | . 125 | 11 |
| 12 | .080808 | . 109 | . 1055 | .104 | . 185 | .109375 | 12 |
| 13 | .071961 | .095 | .0915 | .092 | . 182 | .09375 | 13 |
| 14 | .064084 | .083 | .0800 | .080 | . 180 | .078125 | 14 |
| 15 | .057068 | .072 | .0720 | .072 | .178 | .0030125 | 15 |
| 16 | .05082 | .065 | .0625 | .064 | .175 | .0625 | 16 |
| 17 18 | .045257 | .058 | .0540 | .056 | .172 | .05625 | 17 |
| 18 | .040303 | . 049 . 042 | .0475 | .048 | .168 .164 | .05 | 18 |
| 19 20 | .03589 | .042 | .0410 | | .164 | .04375 | 19 20 |
| 20 21 | .031961 .028462 | .000 | .03175 | .036 | .157 | .0375 .034375 | 20 |
| 22 | .025347 | .032 | .0286 | .032 | .155 | .03125 | 21 22 |
| 23 | .022571 | .025 | .0258 | .028 | .153 | .028125 | 23 |
| 24 | .022371 | .023 | .0230 | .022 | . 151 | .025 | 24 |
| 25 | .0179 | .02 | .0204 | .020 | .148 | .021875 | 25 |
| 26 | .01594 | .018 | .0181 | .018 | .146 | .01875 | 26 |
| 27 | .014195 | .016 | .0173 | .0164 | .143 | .0171875 | 27 |
| 28 | .012641 | .014 | .0162 | .0149 | .139 | .015625 | 28 |
| 29 | .011257 | .013 | .0150 | .0136 | . 134 | .0140625 | 29 |
| 30 | .010025 | .012 | .0140 | .0124 | . 127 | .0125 | 30 |
| 31 | .008928 | . 01 | .0132 | .0116 | . 120 | .0109375 | 31 |
| 32 | . 00795 | .009 | .0128 | .0108 | .115 | .01015625 | 32 |
| 33 | .00708 | .008 | .0118 | .0100 | .112 | .009375 | 33 |
| 34 | .006304 | . 007 | .0104 | .0092 | .110 | .00859375 | 34 |
| 35 | .005614 | .005 | .0095 | .0084 | .108 | .0078125 | 35 |
| 36 | .005 | . 004 | .0090 | .0076 | .106 | .00703125 | 36 |
| 37 | .004453 | | | .0068 | .103 | .006640625 | 37 |
| 38 | .003965 | | | .0060 | .101 | .00625 | 38 |
| 39 | .003531 | | | .0052 | .099 | • • • • • • • • • • | 39 |
| 40 | .003144 | • • • • | 1 | .0048 | . 097 | • • • • • • • | 40 |

HAND BASTARD



Fig. 1634A

HAND SECOND CUT



Fig. 1634B

HAND SMOOTH



Fig. 1634C

FLAT COARSE



Fig. 1634D

FLAT BASTARD



Fig. 1634E

FLAT, SECOND CUT



Fig. 1634F

FLAT SMOOTH



Fig. 1634G

FLAT BASTARD, 2 ROUND EDGES



Fig. 1634H

FLAT SINGLE CUT, SECOND CUT

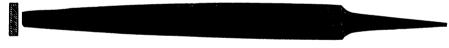
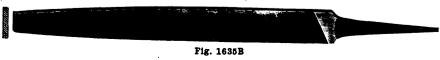


Fig. 1635A

FLAT SINGLE CUT. SMOOTH

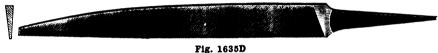


WARDING BASTARD



Fig. 1635C

KNIFE BASTARD



HALF ROUND BASTARD



Fig. 1635E

HALF ROUND, SECOND CUT



Fig. 1635F

HALF ROUND SMOOTH



Fig. 1635G

SQUARE BASTARD



Fig. 1635H

SQUARE, SECOND CUT

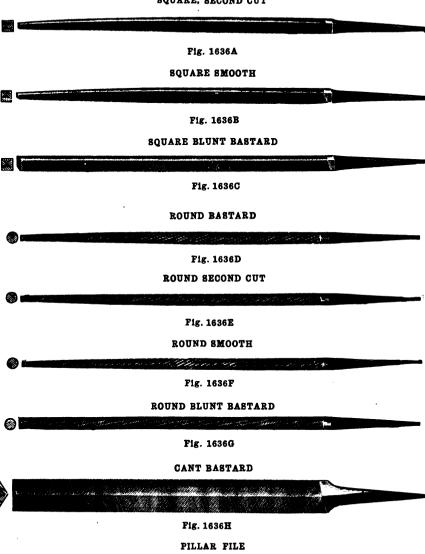


Fig. 1636J

MILL BASTARD



Fig. 1637A

MILL BASTARD. ONE ROUND EDGE

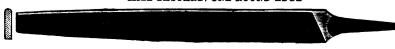


Fig. 1637B

MILL BASTARD, TWO ROUND EDGES

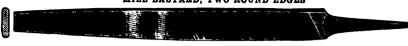


Fig. 1637C

MILL SECOND CUT



Fig. 1637D

MILL DOUBLE CUT. SECOND CUT



Fig. 1637E

CROSS CUT

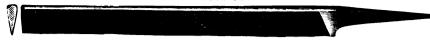


Fig. 1637F



Fig. 1637G

BAND SAW SLIM BLUNT SINGLE CUT



Fig. 1637H

FILES AND RASPS

BAND SAW REGULAR BLUNT SINGLE CUT

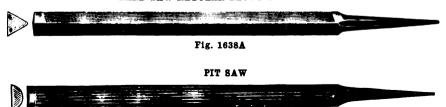


Fig. 1638B

SLIM TAPER



Fig. 1638C



Fig. 1638D



Fig. 1638E

DOUBLE ENDER WITH HANDLE



Fig. 1638F





Fig. 1638G



Fig. 1638H

FILES AND RASPS

HALF ROUND CABINET FILE



PLANER KNIFE FILE

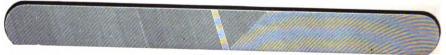


Fig. 5565B

HALF ROUND CABINET RASP



Fig. 5565C

FLAT SHOE RASP



Fig. 5565D

HALF ROUND SHOE RASP



Fig. 5565E

HORSE RASPS

PLAIN RASP



Fig. 5565F

TANGED RASP



Pig. 5565 G

FILES PRICE PER DOZEN

| 48 | MIL | L AND RO | UND | | FLAT | | | SQUARE | |
|--|---|--|--|--|---|--|---|--|---|
| Length Inches | Bastard | 2d Cut | Smooth | Bastard | 2d Cut | Smooth | Bastard | 2d Cut | Smooth |
| 4 5 6 7 8 9 10 11 12 13 | 3.00 3.20 3.50 3.90 4.30 4.90 5.60 6.70 7.50 9.40 10.70 | 3.50 3.80 4.00 4.60 4.90 5.80 6.40 7.80 8.60 10.70 12.20 | 3.90 4.10 4.50 4.90 5.40 6.30 7.00 8.50 9.40 11.70 13.10 | 3 70 3.90 4.30 4.80 5.30 6.30 7.00 8.60 9.70 11.80 13.30 | 4.30 4.60 4.80 5.50 6.10 7.20 8.10 9.80 11.00 13.60 15.30 | 4.70 4.90 5.30 6.10 6.60 7.90 8.70 10.70 12.10 14.70 16.70 | 3.80 4.10 4.60 5.10 5.50 6.60 7.40 9.10 10.20 12.50 13.90 | 4.60 4.80 5.10 5.80 6.30 7.70 8.50 10.40 11.50 14.30 16.10 | 4.90 5.30 5.50 6.30 7.00 8.30 9.10 11.30 12.80 15.40 |
| 15 16 17 18 19 20 | 13.10 14.70 18.20 20.20 24.60 27.40 | 15.00 16.80 20.20 22.70 27.50 30.70 | 16.10 17.90 21.70 24.30 29.40 32.90 | 16.00 17.80 21.50 23.90 28.40 31.50 | 18.30 20.10 24.20 26.80 31.60 35.30 | 20.00 22.30 26.50 29.20 34.60 38.30 | 16.90 18.70 22.50 25.10 29.70 32.80 | 19.20 21.20 25.40 28.20 33.20 36.70 | 20.90 23.30 27.50 30.40 35.70 39.30 |

Cant (Blunt) Double Cut advance 2 inches Square Blunt advance 1 inch

| Length | HAN | d and Pi | LLAR | HALF ROU | ND AND THE | EE SQUARE | | WARDING | |
|----------------------|------------|--------------------|-----------|-----------|------------|---------------------|----------|------------------------|--------|
| Inches | Bastard | 2d Cut | Smooth | Bastard | 2d Cut | Smooth | Bastard | 2d Cut | Smooth |
| 4 | 3.70 | 4.30 | 4.80 | 4.80 | 5.60 | 6.10 | 4.00 | 4.80 | 5.40 |
| 5 | 3.90 | 4.70 | 5.30 | 5.40 | 6.10 | 6.40 | 4.50 | 5.30 | 5.80 |
| 6 | 4.30 | 5.10 | 5.60 | 6.10 | 6.70 | 7.10 | 4.90 | 5.90 | 6.40 |
| 7 | 4.90 | 5.80 | 6.30 | 7.00 | 7.70 | 8.20 | 5.90 | 6.90 | 7.50 |
| 8 | 5.40 | 6.30 | 6.70 | 7.50 | 8.30 | 8.90 | 6.40 | 7.50 | 8.20 |
| 9 | 6.70 | 7.80 | 8.30 | 8.50 | 9.40 | 9.90 | 7.80 | 9.00 | 9.90 |
| 10 | 7.50 | 8.70 | 9.40 | 9.10 | 10.10 | 10.70 | 8.70 | 10.10 | 11.00 |
| 11 | 9.40 | 10.90 | 11.80 | 10.70 | 11.80 | 12.70 | 10.90 | 12.70 | 13.70 |
| 12 | 10.70 | 12.30 | 13.50 | 11.80 | 13.00 | 13.90 | 12.30 | 14.30 | 15.40 |
| 13 | 13.30 | 15.20 | 16.20 | 14.10 | 15.40 | 16.60 | 15.20 | 17.40 | 18.70 |
| 14 | 15.00 | 17.00 | 18.20 | 15.50 | 17.00 | 18.30 | 17.00 | 19.40 | 21.00 |
| 15 | 17.90 | 20.60 | 21.70 | 18.50 | 20.40 | 21.70 | | STAVESAV | |
| 16 | 20.10 | 22.80 | 24.20 | 20.60 | 22.50 | 24.20 | · | SIAVEBAV | · |
| 17 | 24.20 | 27.10 | 28.60 | 24.70 | 27.00 | 28.90 | 8-inch. | | 9.40 |
| 18 | 26.80 | 29.90 | 31.50 | 27.50 | 29.90 | 32.00 | S.m. vii | ESAW IMP | DOPPE |
| 19 | 31.90 | 35.40 | 37.60 | 32.80 | 35.70 | 38.10 | - STAVI | SAW IMP | ROVED |
| 20 | 35.10 | 39.20 | 41.60 | 36.20 | 39.40 | 42.30 | | | 6.40 |
| Slotting | (Blt) | ad | | Crossina | take Ba | 8 " | | 8.10 | |
| Cotter B Reaper . | lunt or Ta | per unce 1 inch | on 2d Cut | TO .1 TO. | lge (Blt) | 9 " 10 " 12 " | | 9.70 10.70 15.40 | |

PRICE PER DOZEN

| | ONE | MILL ROUND | EDGE | Two I | MILL | Edges | Length | TAI | PERS | SLIM TAPERS | | BANDSAW BLUNT AND TAPER | |
|------------------|---------|---------------|--------|---------|--------|--------|------------------|---------------|---------------|---------------|--------|-------------------------------|-------|
| Length Inches | Bastard | 2d Cut | Smooth | Bastard | 2d Cut | Smooth | Length Inches | Single Cut | Double Cut | Single Cut | Double | Regular | Slim |
| 4 | 3.40 | 3.90 | 4.40 | 3.80 | 4.40 | 4.90 | 3 | 2.10 | 2.50 | 2.10 | 2.50 | 2.50 | 2.50 |
| 5 | 3.60 | 4.30 | 4.60 | 4.00 | 4.80 | 5.10 | 31/2 | 2.10 | 2.50 | 2.10 | 2.50 | 2.50 | 2.50 |
| 6 | 3.90 | 4.50 | 5.10 | 4.40 | 5.00 | 5.60 | 4 | 2.20 | 2.90 | 2.20 | 2.60 | 2.90 | 2.60 |
| 7 | 4.40 | 5.20 | 5.50 | 4.90 | 5.80 | 6.10 | 41/2 | 2.40 | 3.10 | 2.30 | 3.00 | 3.10 | 3.00 |
| 8 | 4.80 | 5.50 | 6.10 | 5.40 | 6.10 | 6.80 | 5 | 2.60 | 3.50 | 2.50 | 3.20 | 3.50 | 3.20 |
| 9 | 5.50 | 6.50 | 7.10 | 6.10 | 7.30 | 7.90 | 51/2 | 3.00 | 4.00 | 2.90 | 3.50 | 4.00 | 3.50 |
| 10 | 6.30 | 7.20 | 7.90 | 7.00 | 8.00 | 8.80 | 6 | 3.40 | 4.70 | 3.10 | 3.90 | 4.70 | 3.90 |
| 11 | 7.50 | 8.80 | 9.60 | 8.40 | 9.80 | 10.60 | 7 | 4.30 | 5.60 | 3.80 | 4.50 | 5.60 | 4.50 |
| 12 | 8.40 | 9.70 | 10.60 | 9.40 | 10.80 | 11.80 | 8 | 5.40 | 6.70 | 4.50 | 5.30 | 6.70 | 5.30 |
| 13 | 10.60 | 12.00 | 13.20 | 11.80 | 13.40 | 14.60 | 9 | 6.60 | 8.10 | 5.40 | 6.30 | 8.10 | 6.30 |
| 14 | 12.00 | 13.70 | 14.70 | 13.40 | 15.30 | 16.40 | 10 | 8.10 | 9.70 | 6.40 | 7.50 | 9.70 | 7.50 |
| 15 | 14.70 | 16.90 | 18.10 | 16.40 | 18.80 | 20.10 | 11 | 10.70 | 12.10 | 8.30 | 9.10 | 12.10 | 9.10 |
| 16 | 16.50 | 18.90 | 20.10 | 18.40 | 21.00 | 22.40 | 12 | 12.50 | 14.70 | 9.50 | 11.00 | 14.70 | 11.00 |
| 17 | 20.50 | 22.70 | 24.40 | 22.80 | 25.30 | 27.10 | 13 | 15.90 | 17.50 | 12.10 | 13.10 | 17.50 | 13.10 |
| 18 | 22.70 | 25.50 | 27.30 | 25.30 | 28.40 | 30.40 | 14 | 18.20 | 20.60 | 13.80 | 15.40 | 20.60 | 15.40 |

| | PIT CANT SAW SAW | | Cross Cut | Ноок Тоотн | PLAN- ER KNIFE | In- serted | | | Knife | | Patent Double | |
|------------------|----------------------|---------------|---------------|---------------|----------------------|--------------------------------|------------------|---------|--------|--------|-------------------------|--|
| Length Inches | Single Cut | Single Cut | Single Cut | Single Cut | Single Cut | Tooth or Chisel Tooth | Length Inches | Bastard | 2d Cut | Smooth | Ender with Handle | |
| 4 | 4.80 | 4.30 | 4.80 | | | | 4 | 5.40 | 6.10 | 6.40 | | |
| 5 | 5.40 | 4.70 | 5.40 | | | | 5 | 6.10 | 6.70 | 7.10 | • • • • • | |
| 6 | 6.10 | 5.40 | 6.10 | 6.70 | | ١ ا | | | | | 250 | |
| 7 | 7.00 | 6.10 | 7.00 | 7.70 | | ۱ ا | 6 | 6.90 | 7.50 | 7.90 | 3.50 | |
| 8 | 7.50 | 6.40 | 7.50 | 8.30 | 6.40 | 8.30 | 7 | 7.80 | 8.50 | 8.90 | 3.50 | |
| 9 | 8.50 | 7.80 | 8.50 | 9.40 | | 9.40 | 8 | 8.50 | 9.10 | 9.50 | 3.90 | |
| 10 | 9.10 | 8.70 | 9.10 | 10.10 | 8.60 | 10.10 | 9 | 9.40 | 10.60 | 11.30 | 4.40 | |
| 11 | 10.70 | 10.40 | 10.70 | 1 | | | 10 | 10.10 | 11.50 | 12.30 | 4.90 | |
| 12 | 11.80 | 11.40 | | 13.00 | 12.10 | | 11 | 12.20 | 13.70 | 14.60 | • • • • • | |
| | •••• | 11 | 110 | | 12.10 | ' | 12 | 13.70 | | 16.10 | • • • • • | |
| - | | . – – | | | | | 13 | 16.30 | 17.90 | 19.20 | | |
| | adv. 2 i Gulletin | | | | stard. | | 14 | 18.20 | 19.90 | 21.20 | | |

FILES AND RASPS

PRICE PER DOZEN

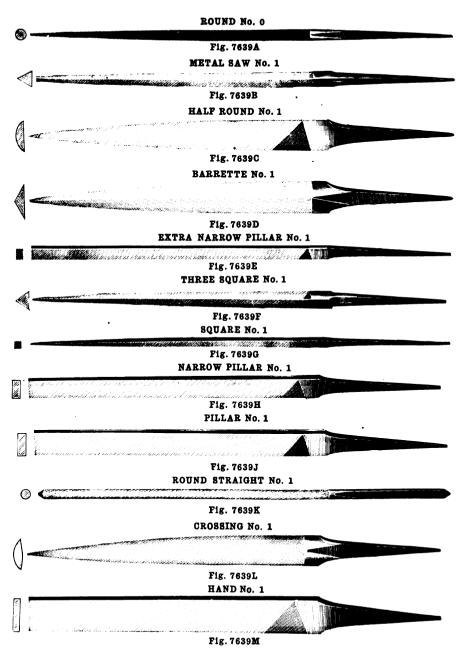
| Length, | ; | Horse Rasp | 8 | File | Rasps | Wood Files | | | | |
|-------------------|-------|---------------------------|--------|-------|---------------|------------|---------------|---------|--|--|
| Length, Inches | Plain | Beveled and 34 Rasp | Tanged | Flat | Half Round | Flat | Half Round | Cabinet | | |
| 6 | | | | 7.40 | 8.10 | 4.30 | 6.10 | 8.10 | | |
| 7 | | | | 8.60 | 9.30 | 4.80 | 7.00 | 9.30 | | |
| 8 9 | | | | 9.40 | 10.10 | 5.30 | 7.50 | 10.10 | | |
| 9 | | 1 | | 11.40 | 12.20 | 6.30 | 8.50 | 12.20 | | |
| 10 | 9.40 | 10.70 | 12.80 | 12.80 | 13.70 | 7.00 | 9.10 | 13.70 | | |
| 11 | 11.40 | 12.90 | 15.20 | 15.50 | 16.80 | 8.60 | 10.70 | 16.80 | | |
| 12 | 12.80 | 14.40 | 16.80 | 17.50 | 18.70 | 9.70 | 11.80 | 18.70 | | |
| 13 | 15.20 | 17.00 | 19.60 | 20.90 | 22.40 | 11.80 | 14.10 | 22.40 | | |
| 14 | 17.80 | 20.10 | 23.10 | 23.20 | 24.80 | 13.30 | 15.50 | 24.80 | | |
| 15 | 20.90 | 23.60 | 27.30 | 27.80 | 29.70 | 16.00 | 18.50 | 29.70 | | |
| 16 | 24.40 | 27.50 | 32.20 | 30.80 | 32.90 | 17.80 | 20.60 | 32.90 | | |
| 17 | 28.90 | 31.50 | | 36 20 | 38.90 | 21.50 | 24.70 | 38.90 | | |
| 18 | 32.90 | 36.20 | | 40.90 | 43.60 | 23.90 | 27.50 | 43.60 | | |

| | | Wood Rasps | | SHOE RASPS | | | | | |
|----------------|----------------|----------------|----------------|------------|------------------|----------|--|--|--|
| Length, Inches | Flat | Half Round | Cabinet | Flat | Half Round | Oval | | | |
| 6 | 7.40 | 8.10 | 10.10 | 8.10 | 8.10 | 9.30 | | | |
| 7 | 8.60 | 9.30 | 11.70 | 9.30 | 9.30 ' | 10.10 | | | |
| 8 | 9.40 | 10.10 | 12.80 | 10.10 | 10.10 | 12.20 | | | |
| 8 9 | 11.40 | 12.20 | 15.50 | 12.20 | 12.20 | 13.70 | | | |
| 10 | 12.80 | 13.70 | 17.50 | 13.70 | 13.70 | 16.80 | | | |
| 11 | 15.50 | 16.80 | 20.70 | 16.80 | 16.80 | 18.70 | | | |
| 12 | 17.50 | 18.70 | 22.80 | 18.70 | 18.70 | 22.40 | | | |
| 13 | 20.90 | 22.40 | 26.80 | 22.40 | 22.40 | | | | |
| 14 | 23.20 | 24.80 | 29.60 | 24.80 | 24.80 | | | | |
| 15 | 27.80 | 29.70 | 33.90 | | | | | | |
| 16 17 | 30.80 36.20 | 32.90 38.90 | 36.90 42.40 | 1 | LASTMAKERS' RASP | ·s | | | |
| 18 | 40.90 | 43.60 | 46.90 | One inch | advance on Cabin | et Rasps | | | |

Sizes below 4 inches, not extended, take 4-inch price.
Half inches not specified take next higher full inch price.
Dead Smooth, double the price of Bastard Cut.
One Round Edge, advance 12½ per cent.
All lengths above those listed advance 20 per cent on next lower inch price.
Blunt Files not specified advance one inch on respective kinds and cuts.
Single or Float cut not specified, on regular shapes take Double Cut price.
Equalings (Bellied), advance two inches on respective kinds and cuts.
Two Round Edges, advance 25 per cent.
Files varying from standard sizes, subject to special prices.
Cuts not specified, made upon regular blanks, advance one inch on respective.

Cuts not specified, made upon regular blanks, advance one inch on respective kinds and nearest cut.

SWISS PATTERN FILES



SWISS PATTERN FILES

PRICE PER DOZEN

| | | | | НА | ND | | | | R, PILL AR EXT | | | | UARE TAL S | |
|------|------|-------|-------|-------|-------|-------|-------|-------|-------------------|-------|-------|-------|---------------|-------|
| No | | 00-2 | 3-4 | 5 | 6 | 7 | 8 | 00-2 | 3-4 | 5-6 | 7-8 | 00-2 | 3-5 | 6-8 |
| 3 | inch | 2.80 | 2.90 | 3.00 | 3,15 | 3.30 | 3.45 | 2.60 | 2,65 | 2.70 | 2.80 | 2.80 | 2.95 | 3.05 |
| 31/2 | " | 3.00 | 3.15 | 3.20 | 3.35 | 3.55 | 3.75 | 2.75 | 2.80 | 2.90 | 3.00 | 3.05 | 3.15 | 3.30 |
| 4 | " | 3.15 | 3.30 | 3.40 | 3.55 | 3.75 | 3.95 | 2.95 | 3.00 | 3.10 | 3.20 | 3.30 | 3.40 | 3.50 |
| 41/2 | | 4.15 | 4.25 | 4.40 | 4.60 | 4.80 | 5.00 | 3.85 | 3.90 | 4.00 | 4.15 | 4.15 | 4.25 | 4.40 |
| 5 | " | 4.35 | 4.50 | 4.70 | 5.00 | 5.20 | 5.40 | 4.00 | 4.15 | 4.25 | 4.45 | 4.35 | 4.45 | 4.60 |
| 6 | " | 4.80 | 5.00 | 5.20 | 5.40 | 5.80 | 6.20 | 4.30 | 4.40 | 4.55 | 4.75 | 5.00 | 5.10 | 5.25 |
| 7 | " | 6.40 | 6.60 | 6.80 | 7.20 | 7.60 | 8.00 | 5.50 | 5.70 | 6.00 | 6.15 | 6.60 | 6.90 | 7.20 |
| 8 | " | 7.00 | 7.20 | 7.60 | 8.00 | 8.40 | 9.15 | 6.50 | 6.70 | 6.90 | 7.10 | 7.80 | 8.15 | 8.55 |
| 10 | " | 9.55 | 9.90 | 10.50 | 11.10 | 11.50 | 12.30 | 8.70 | 8.90 | 9.30 | 9.70 | 9.15 | 9.55 | 9.90 |
| 12 | " | 12.30 | 12.60 | 13.60 | 14.00 | 14.70 | 15.50 | 11.20 | 12.00 | 14.10 | 15.50 | 11.20 | 11.60 | 12.00 |
| 14 | " | 15.00 | 15.00 | 16.00 | 17.00 | 18.20 | 19.50 | | | | | | | |

| | | | Kn | IFE | | | WAR | DING | | Нл | F Ro | UND | C | ROSSIN | i G |
|------|------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------------|-------|--------|-------|
| No | •••• | 00-2 | 3-4 | 5-6 | 7-8 | 00-2 | 3-4 | 5-6 | 7-8 | 00-2 | 3-5 | 6-8 | 00-2 | 3-5 | 6-8 |
| 3 | inch | 2.90 | 3.00 | 3.05 | 3.15 | 2.55 | 2.60 | 2.70 | 2.80 | 2.90 | 3.00 | 3.15 | 2.80 | 2.85 | 2.95 |
| 31/2 | " | 3.30 | 3.35 | 3.45 | 3.55 | 2.80 | 2.90 | 3.00 | 3.15 | 3.05 | 3.15 | 3.60 | | | |
| 4 | " | 3.60 | 3.70 | 3.80 | 3.90 | 3.15 | 3.30 | | | 3.20 | | | | 3.80 | |
| 41/2 | " | 4.60 | 4.75 | | | | | | | 4.10 | | 5.10 | | | |
| 5 | 44 | 4.90 | 5.10 | 5.30 | 5.50 | 4.20 | 4.40 | | 4.80 | | | | | 5.40 | |
| 6 | 44 | 5.40 | 5.80 | 6.20 | 6.60 | | 5.00 | | | 5.00 | | 6.15 | | | |
| 7 | " | 7.20 | 7.60 | 8.00 | 8.40 | | | 6.80 | | | | 8.20 | | | |
| 8 | " | 8.80 | | | 10.00 | | | 7.60 | | | | | 8.50 | | |
| 10 | " | | | | | | | | | | | | 11.50 | | |
| 12 | " | 12.30 | 12.70 | 13.10 | 13.50 | 11.40 | 12.20 | 12.60 | 13.00 | 12.90 | 16.90 | 19.3 0 | 14.70 | 18.50 | 22.00 |

| | | BA | BARRETTE | | 8 | QUARI | 3 | ROUND BARRETTE Cut All Sides and CANT | | | Скоснет | | | | | |
|----------------|-------|-------|----------|-------|------|-------|-------|---------------------------------------|--------------|-------|---------|-------|-------|-------|-------|-------|
| No | | 00-2 | 3-5 | 6-8 | 00-2 | 3.5 | 6-8 | 00-2 | 3-5 | 6-8 | 00-2 | 3.5 | 68 | 00-2 | 3-5 | 6-8 |
| 3 | inch. | 2.80 | 2.85 | 2.95 | 2.25 | 2.25 | 2.25 | 2.05 | 2.05 | 2.05 | 3.30 | 3.35 | 3.45 | 2.80 | 3.00 | 3.20 |
| $3\frac{1}{2}$ | " | 3.25 | 3.35 | 3.40 | 2.50 | 2.50 | 2.50 | 2.25 | 2.25 | 2.25 | 3.90 | 4.00 | 4.10 | 3.20 | 3.40 | 3.60 |
| 4 | " | 3.70 | 3.75 | 3.85 | 2.80 | 2.95 | 3.05 | 2.50 | 2.60 | 2.65 | 4.40 | 4.60 | 4.80 | 3.50 | 3.70 | 3.90 |
| 41/2 | " | 4.60 | 4.75 | 4.95 | 3.70 | 3.75 | 3.90 | 3.25 | 3.35 | 3.50 | 5.80 | 6.00 | 6.20 | 4.40 | 4.70 | 5.00 |
| 5 | 44 | 5.25 | 5.40 | 5.60 | 3.85 | 3.95 | 4.05 | 3.35 | 3.50 | 3.70 | 6.20 | 6.40 | 6.55 | 4.60 | 4.95 | 5.25 |
| 6 | " | 6.20 | 6.35 | 6.55 | 4.40 | 4.55 | 4.70 | 3.70 | 3.90 | 4.10 | 7.35 | 7.60 | 7.75 | 5.40 | 5.70 | 6.00 |
| 7 | ** | 7.95 | 8.15 | 8.35 | 5.65 | 5.85 | 6.00 | 4.85 | 5.25 | 5.65 | 8.60 | 8.90 | 9.10 | 7.20 | 7.60 | 8.00 |
| 8 | " | 9.15 | 9.35 | 9.55 | 6.40 | 6.80 | 7.20 | 5.65 | 6. 00 | 6.40 | 10.00 | 10.40 | 10.60 | 8.35 | 8.75 | 9.15 |
| 10 | 44 | 12.30 | 12.50 | 12.80 | 7.20 | 8.00 | 8.80 | 7.60 | 8.35 | 9.55 | | | | 11.60 | 12.00 | 12.45 |
| 12 | ** | 15.50 | 15.70 | 16.00 | 8.80 | 9.60 | 10.40 | 9.30 | 10.10 | 11.30 | | | ١ | · | | |

| Sizeinches | 3 | 314 | 4 | 416 | - 5 | 6 | 7 | 8 | 10 | 12 |
|--|------|------|------|------|------|------|-------------------|------|---------|----------|
| Equaling, all Cuts | 2.50 | 2.80 | 3.20 | 4.20 | 4.55 | 4.90 | $\overline{6.10}$ | 6.90 | 10.00 | 13.50 |
| Slitting, all Cuts | 3.15 | 3.50 | 4.00 | 5.20 | 5.70 | 6.80 | 8.20 | 9.40 | 12.60 | 16.00 |
| Round Straight, all Cuts | 2.25 | 2.50 | 2.80 | 3.50 | 3.90 | 4.50 | 6.00 | 7.20 | | |
| Drill or Joint, Round or Square Edge, all Cuts | 2.50 | 2.60 | 2.70 | 3.50 | 4.05 | 4.40 | 5.45 | 5.85 | | |
| Thickness of Drill or Joint inches } Thin | .02 | .03 | .04 | .05 | .06 | .08 | .09 | .10 | • • • • | |
| Thickness of print or Joint inches & Thick | .06 | .07 | .08 | .09 | .10 | .12 | .13 | .14 | | <u> </u> |

SWISS PATTERN FILES, FILE CARDS, ETC.

NEEDLE FILES

| Price, | 10 c/m or 4- | inch, | round | handles | per dozen | 1.90 |
|--------|-----------------------------------|------------|-------|---------|-----------|------|
| " | $12 \text{ c/m or } 4\frac{3}{4}$ | í " | " | 44 | | 1.90 |
| " | $14 \text{ c/m or } 5\frac{1}{2}$ | ž " | 66 | 66 | | 2:10 |
| " | $16 \text{ c/m or } 6\frac{1}{2}$ | . " | 44 | 66 | | 2.25 |
| 66 | $14 \text{ c/m or } 5\frac{1}{2}$ | 3 " | squar | в " | 66 | 2.35 |

Round, Half Round, Flat, Oval, Knife, Square, 3-Square, Equaling, Slitting, Joint, Barrette, and Marking (if round handle), or Half Round Blunt (if square handle)

DIE SINKERS

Price, 31/4-inch, 12 in a set, assorted shapesper set 2.80

BENT RIFFLERS

Price, assorted shapes, handled per set of 6 3.00

FILE CARD

FILE CARDS



Fig. 2501A

Price, with Scorer per dozen

Fig. 2501R

Price, with Scorer per dozen 4.80

FILE HANDLES

2.75

With Brass Ferrules



Fig. 2501C

| No. 1, smallper (| gross | |
|-------------------|-------|--|
| No. 2, medium | | |
| No. 3. large | " | |
| No. 4. assorted | | |

JEWELERS' FILE HANDLES

| Number | 1 | 2 | 3 | 4 |
|----------------|-------|-----|-----|-----------|
| Diameterinches | 1 | 1/2 | 5/8 | 3/4 |
| Priceper gross | ••••• | | | • • • • • |

MACHINISTS' SCRAPERS



Fig. 2501D



Fig. 2501E

2.75 Price, assorted shapes, handledper set of 6

VIXEN HAND MILLING TOOLS



Fig. 8583A

PRICE PER DOZEN BLADES

ONE BACK AND HANDLE FREE WITH EACH DOZEN In Effect July 1, 1909

| Description | | | Fi | AT. | | | | | HALF | Round | | |
|-------------|------|------|------|-------|-------|-------|------|------|------|-------|-------|-------|
| Sizeinches | | | | | | | | | | | | |
| Regular Cut | 5.00 | 6.25 | 7.50 | 9.00 | 10.75 | 13.00 | 4.25 | 5.25 | 6.45 | 7.80 | 9.40 | 11.50 |
| Fine Cut | 6.00 | 7.25 | 8.50 | 10.00 | 11.75 | 14.00 | 5.00 | 6.00 | 7.20 | 8.55 | 10.15 | 12.25 |

DIMENSIONS AND CUTS

| Length of Blade Inches | Width of Biade Inches | Regular Cut Teeth per Inch | Fine Cut Teeth per Inch |
|---------------------------|--------------------------|-------------------------------|----------------------------|
| 8 | 13/6 | 1316 | 16 |
| 10 | 1 1 | 12 | 142/3 |
| 12 | 13/6 | $10\frac{2}{3}$ | 1313 |
| 14 | 13 8 | $91\overline{3}$ | 12 |
| 16 | 1% | 91/3 | 12 |
| 18 | 1916 | 913 | 12 |

RESHARPENING BLADES PER DOZEN

| Description | | | FL | AT | | i | | | HALF | Rouni | D | |
|-------------|------|------|------|------|------|------|-----|-----|------|-------|------|------|
| Sizeinches | | | | | | | | | | | | |
| Regular Cut | .75 | 1.00 | 1.25 | 1.50 | 1.85 | 2.25 | .50 | .65 | .80 | 1.00 | 1.25 | 1.50 |
| Fine Cut | 1.00 | 1.25 | 1.50 | 1.75 | 2.10 | 2.65 | .75 | .90 | 1.05 | 1.30 | 1.60 | 1.90 |

EXTRA PARTS

| Size | | in | ches 8 | 10 | 12 | 14 | 16 | 18 |
|--------|-------|------------------|-------------|------|------|------|------|------|
| Price, | Extra | Backs*per de | ozen 3.00 | 3.25 | 3.50 | 3.75 | 4.00 | 4.25 |
| " | 44 | Bolts and Nutspe | r set .10 | .10 | .10 | .10 | .10 | .10 |
| 46 | | Handles | | | | | .10 | .10 |
| " | 44 | " per de | ozen 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

*Including bolts, nuts and handle.

"Vixen" Patent Hand Milling Tools, owing to their circular teeth, cannot possibly chatter or chase, and produce a very even surface.

The "Vixen" Patent Hand Milling Tool works well on a greased surface.

What it will cut. The "Vixen" Patent Hand Milling Tool is adapted to soft and

tool steel, cast and wrought iron, bronze, copper, brass, and all other hard metals, and owing to its self-clearing properties, is the only tool which will cut brass, aluminum, and other soft metals without clogging. It is also invaluable as a wood and farrier's rasp.

and can be used on slate, marble, etc.

The "Vixen" Patent Hand Milling Tool can be resharpened at least 6 times. Moreover, after each resharpening the file is again equal to new.

While the first cost of the "Vixen" Patent Hand Milling Tool may appear to be high, the amount of work it will do, its extremely long life, its great speed and ease of operation, and the fact that it can be resharpened at least 6 times, makes it a desirable purchase.



CARBORUNDUM AND EMERY WHEELS

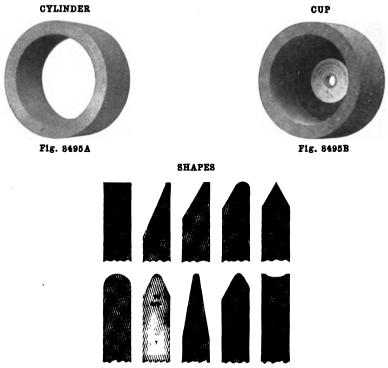


Fig. 8495C

The two characteristics of hardness and sharpness taken together make carborundum the ideal abrasive or grinding substance.

A carborundum wheel cuts; its work is like that of the turning lathe or planer, as distinguished from the action of the file or rubbing brick. Does smoother work and a better quality of work.

Carborundum breaks before it will bend, and in breaking it renews and maintains constantly its sharp cutting edges. These wheels never become gummed nor clogged. Never wear smooth, always sharp and ready for work. Cuts cleaner, produces less frictional heat, lasts longer, and does the work much faster.

It is a refractory material, produced from silicon and carbon, and is formed at a temperature where the purest fire clays exist only as vapors.

Made into grinding wheels to meet requirements of practically every branch of manufacture. Also made into sharpening stones, hones, bricks, knife sharpeners, paper and cloth, and into crystals, grains and powders. Grinder and polisher of metal, rubber, marble, ruby, granite, sapphire, terra cotta, glass, porcelain, pearl, wood, paper pulp, leather, rawhide, etc.

The above diagram illustrates some of the most common forms of wheel edges. The bevels and concaved shapes are made by turning up the plain No. 1 shapes with a diamond. There is no limit to the forms that may be produced by a handy man with a diamond point to work with. Wheels supplied with any of the common forms of wheel edges without extra charge.

In ordering wheels state the shape desired.

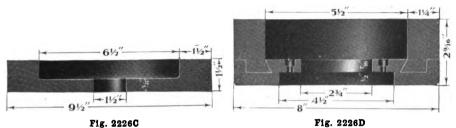
CARBORUNDUM WHEELS

SPECIAL SHAPES
FOR CUTTERS AND REAMERS



| Fig. 2226A Fig. 223 | Fig. 2226B | | | | | | |
|---------------------|------------|------|--|--|--|--|--|
| Number | 625 | 603 | | | | | |
| Priceeach | 2.00 | 4.00 | | | | | |

FOR TWIST DRILL GRINDING No. 1002 No. 1026

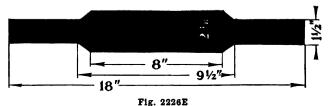


 Number
 1002
 1026

 Price
 each
 8.40
 *9.60

*No. 1026 with iron center, 2.25 net extra.

FOR CAR WHEEL GRINDING No. 861



No. 884 No. 885 26" 30" Fig. 2226F Fig. 2226G

 Number
 884
 885

 Price
 each
 161.50
 239.50

CARBORUNDUM AND EMERY WHEELS

REGULAR

| Diam. | | | | Тн | ICKNESS, | INCHES | | | | Revolu- |
|---|---|---|---|---|--|--|---|---|---|--|
| Inches | 1/4 | 3/8 | 16 | 5/8 | 34 | 7/8 | 1 | 11/4 | 11/2 | tions per Minute |
| 1 | $-\frac{7}{.25}$ | -30 | $\frac{-2}{.30}$ | .35 | $-\frac{4}{.35}$ | -1.40 | .40 | $\frac{-74}{.45}$ | .50 | 19099 |
| 11/2 | .30 | .35 | .40 | .45 | .45 | .50 | .50 | .55 | .60 | 12733 |
| $ar{2}^{'}_{2}$ | .35 | .45 | .50 | .55 | .55 | .60 | .60 | .65 | .70 | 9549 |
| $2\frac{1}{2}$ | .40 | .55 | .65 | .70 | .75 | .80 | .85 | .95 | 1.05 | 7639 |
| 3 | .50 | .65 | .80 | .90 | .95 | 1.05 | 1.10 | 1.25 | 1.40 | 6366 |
| 31/2 | .60 | .80 | .95 | 1.05 | 1.15 | 1.25 | 1.35 | 1.55 | 1.75 | 5457 |
| 4 | .75 | .95 | 1.10 | 1.25 | 1.35 | 1.50 | 1.60 | 1.85 | 2.10 | 4775 |
| 41/2 | .90 | 1.10 | 1.25 | 1.40 | 1.55 | 1.70 | 1.85 | 2.15 | 2.45 3.00 | 4244 3820 |
| 5 6 | 1.00 | 1.20 1.60 | 1.40 | 1.60 | 1.80 | $\frac{2.00}{2.75}$ | $\frac{2.20}{3.05}$ | 2.60 3.70 | 4.35 | 3183 |
| 7 | 1.40 | 2.00 | $1.75 \\ 2.15$ | $2.10 \\ 2.60$ | $\frac{2.40}{3.00}$ | $2.75 \\ 3.45$ | 3.85 | 4.70 | 5.55 | 2728 |
| 8 | $1.85 \\ 2.10$ | 2.35 | 2.60 | 3.10 | 3.60 | 4.10 | 4.60 | 5.60 | 6.60 | 2387 |
| 9 | $\frac{2.10}{2.50}$ | 2.80 | 3.10 | 3.70 | 4.25 | 4.85 | 5.40 | 6.55 | 7.70 | 2122 |
| 10 | 3.00 | 3.35 | 3.65 | 4.35 | 5.00 | 5.70 | 6.35 | 7.70 | 9.05 | 1910 |
| 12 | 3.60 | 3.80 | 4.00 | 5.00 | 6.00 | 6.70 | 7.40 | 9.00 | 10.70 | 1592 |
| 14 | 4.05 | 5.15 | 6.25 | 7.35 | 8.45 | 9.55 | 10.65 | 12.85 | 15.05 | 1364 |
| 16 | 5.75 | 7.00 | 8.50 | 9.50 | 10.85 | 12.30 | 13,70 | 16.55 | 19.40 | 1194 |
| 18 | 7.50 | 9.00 | 10.50 | 11.75 | 13.25 | 15.15 | 17.00 | 20.75 | 24.50 | 1061 |
| 20 | 9.50 | 11.25 | 13.00 | 14.50 | 16.75 | 18.25 | 20.25 | 24.75 | 29.25 | 955 |
| 22 | 11.50 | 13.50 | 15.25 | 17.25 | 19.00 | 22.00 | 25 .00 | 31.00 | 37.00 | 868 |
| 24 | 14.00 | 16.00 | 18.00 | 20.00 | 22.00 | 26.00 | 29.00 | 36.00 | 43.00 | 796 |
| 26· | | •••• | • • • • | | • • • • • | | 35.00 | 43.00 | 51.00 | 735 |
| 30 | • • • • • | •••• | •••• | •••• | • • • • | • • • • • | • • • • • | | 61.00 | 637 |
| <u> 36</u> | <u> </u> | | | | | | | <u> </u> | 95.00 | 531 |
| Diam. | | | | | ICKNESS, | | | | | Revolu- |
| Inches | 13/4 | $oldsymbol{2}$. | 01/ | | | | | | | |
| 1 | | 1 | $-\frac{2!}{4}$ | 2^{1} ₂ | 23/4 | 3 | 314 | 31/2 | 4 | Minute |
| | .55 | .60 | .65 | .70 | . 75 | .80 | .85 | .90 | 1.00 | Minute 19099 |
| 11/2 | . 55 . 6 5 | .60 .70 | .65 .75 | .70 .80 | .75 .85 | .80 .90 | .85 .95 | .90 1.00 | 1.00 1.10 | 19099 12733 |
| $\frac{1}{2}$ | .55 .65 .75 | .60 .70 .80 | .65 .75 .85 | .70 .80 .90 | .75 .85 .95 | .80 .90 1.00 | .85 .95 1.05 | .90 1.00 1.10 | 1.00 1.10 1.20 | 19099 12733 9549 |
| $\frac{1}{2}$ $\frac{2}{2}$ | .55 .65 .75 | .60 .70 .80 1.25 | .65 .75 .85 1.35 | .70 .80 .90 1.45 | .75 .85 .95 1.55 | .80 .90 1.00 1.65 | .85 .95 1.05 1.75 | .90 1.00 1.10 1.85 | 1.00 1.10 1.20 2.05 | 19099 12733 9549 7639 |
| 1½ 2 2½ 3 | .55 .65 .75 1.15 1.55 | .60 .70 .80 1.25 1.70 | .65 .75 .85 1.35 1.85 | .70 .80 .90 1.45 2.00 | .75 .85 .95 1.55 2.15 | .80 .90 1.00 1.65 2.30 | .85 .95 1.05 1.75 2.45 | .90 1.00 1.10 1.85 2.60 | 1.00 1.10 1.20 2.05 2.90 | 19099 12733 9549 7639 6366 |
| 1½ 2 2½ 3 3½ | .55 .65 .75 1.15 1.55 1.95 | .60 .70 .80 1.25 1.70 2.15 | .65 .75 .85 1.35 1.85 2.35 | .70 .80 .90 1.45 2.00 2.55 | .75 .85 .95 1.55 2.15 2.75 | .80 .90 1.00 1.65 2.30 2.95 | .85 .95 1.05 1.75 2.45 3.15 | .90 1.00 1.10 1.85 2.60 3.35 | 1.00 1.10 1.20 2.05 2.90 3.75 | 19099 12733 9549 7639 6366 5457 |
| 1½ 2 2½ 3 3½ 4 | .55 .65 .75 1.15 1.55 1.95 2.35 | .60 .70 .80 1.25 1.70 2.15 2.60 | .65 .75 .85 1.35 1.85 2.35 2.85 | .70 .80 .90 1.45 2.00 2.55 3.10 | .75 .85 .95 1.55 2.15 2.75 3.35 | .80 .90 1.00 1.65 2.30 2.95 3.60 | .85 .95 1.05 1.75 2.45 3.15 3.85 | .90 1.00 1.10 1.85 2.60 3.35 4.10 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 | 19099 12733 9549 7639 6366 5457 4775 |
| 1½ 2 2½ 3 3½ 4 4½ 5 | .55 .65 .75 1.15 1.55 2.35 2.75 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 | .65 .75 .85 1.35 1.85 2.35 2.85 3.35 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 | .75 .85 .95 1.55 2.15 2.75 3.35 3.95 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 | 1.00 1.10 1.20 2.05 2.90 3.75 | 19099 12733 9549 7639 6366 5457 4775 4244 |
| 1½ 2 2½ 3 3½ 4 4½ 5 | .55 .65 .75 1.15 1.55 1.95 2.35 | .60 .70 .80 1.25 1.70 2.15 2.60 | .65 .75 .85 1.35 1.85 2.35 2.85 | .70 .80 .90 1.45 2.00 2.55 3.10 | .75 .85 .95 1.55 2.15 2.75 3.35 | .80 .90 1.00 1.65 2.30 2.95 3.60 | .85 .95 1.05 1.75 2.45 3.15 3.85 | .90 1.00 1.10 1.85 2.60 3.35 4.10 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 | 19099 12733 9549 7639 6366 5457 4775 |
| 1½ 2½ 3½ 4¼ 4½ 6 | .55 .65 .75 1.15 1.55 1.95 2.35 2.75 3.40 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 3.80 | .65 .75 .85 1.35 1.85 2.35 2.85 3.35 4.20 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 | .75 .85 .95 1.55 2.15 2.75 3.35 3.95 5.00 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 | 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 |
| 1½ 2½ 3½ 4½ 4½ 5 6 7 8 | .55 .65 .75 1.15 1.55 2.35 2.75 3.40 5.00 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 3.80 5.65 | .65 .75 .85 1.35 1.85 2.35 2.85 3.35 4.20 6.30 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 | .75 .85 .95 1.55 2.15 2.75 3.35 3.95 5.00 7.60 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 8.25 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 8.90 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 |
| 1½ 2½ 3½ 4¼ 4½ 6 | .55 .65 .75 1.15 1.55 2.35 2.75 3.40 5.00 6.40 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 3.80 5.65 7.25 | .65 .75 .85 1.35 2.35 2.85 3.35 4.20 6.30 8.10 9.60 11.15 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 10.60 12.30 | .75 .85 .95 1.55 2.15 2.75 3.35 5.00 7.60 9.80 91.60 13.45 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 8.25 10.65 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 8.90 11.50 11.50 15.75 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 14.05 19.20 | 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 |
| 1½ 2½ 3½ 4½ 4½ 5 6 7 8 9 10 | .55 .65 .75 1.15 1.55 1.95 2.35 2.75 3.40 5.00 6.40 7.60 8.85 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 3.85 7.25 8.60 10.00 11.75 | .65 .75 .85 1.35 1.85 2.35 2.85 3.35 4.20 6.30 8.10 9.60 91.15 13.10 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 | .75 .85 .95 1.55 2.15 2.75 3.35 5.00 7.60 9.80 11.60 13.45 15.80 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 8.25 10.65 12.60 14.60 17.15 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 8.90 11.50 13.60 13.60 15.75 18.50 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 19.85 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.20 22.55 | Minute 19099 1273 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 |
| 1½ 2½ 3½ 3½ 4½ 5 6 7 8 9 10 12 | .555 .655 .755 1.155 1.555 2.355 2.75 3.40 5.00 6.40 7.60 8.85 10.40 12.75 | .60 .70 .80 1.25 1.70 2.160 3.05 3.80 5.65 7.25 8.60 10.00 11.75 14.00 | .65 .75 .85 1.35 1.85 2.35 2.85 3.35 4.20 6.30 8.10 9.60 11.15 13.10 15.70 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 | .75 .85 .95 1.55 2.15 2.75 3.35 3.95 5.00 7.60 9.80 11.60 13.45 15.80 19.00 | .80 .90 1.00 1.65 2.95 3.60 4.25 5.42 10.65 12.60 14.60 17.15 20.75 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 11.50 13.60 13.60 15.75 18.50 22.50 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 19.85 24.25 | 1.00 1.10 1.20 2.05 2.99 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.20 22.55 27.50 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 |
| 1½ 2 1½ 3 3½ 4 4½ 5 6 7 8 9 10 12 14 | .555 .655 .755 1.155 1.955 2.755 2.755 3.40 5.00 6.40 7.60 8.850 10.40 12.75 17.25 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 3.80 5.65 7.25 8.60 10.00 11.75 14.00 19.45 | .65 .75 .85 1.35 2.35 2.85 3.35 4.20 6.30 8.10 9.60 11.15 13.10 15.70 21.65 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 23.85 | .75 .85 .95 1.55 2.75 3.35 3.95 5.00 7.60 9.80 11.60 13.45 15.80 19.00 26.05 | .80 .90 1.00 1.63 2.95 3.60 4.25 5.40 8.25 10.65 12.60 14.60 17.15 20.75 28.25 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 11.50 13.60 15.75 18.50 22.50 30.45 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 19.85 24.25 32.65 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.20 22.55 27.50 37.05 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 1364 |
| 1½ 2 2½ 3 3½ 4 4½ 5 6 7 8 9 10 12 14 16 | .555 .655 .755 1.155 1.955 2.355 2.75 3.40 5.00 6.40 7.60 8.85 10.40 112.75 17.25 122.25 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 5.65 7.25 8.60 10.00 11.75 14.00 19.45 25.00 | .65 .75 .85 1.35 2.35 2.85 3.35 4.20 6.30 9.60 11.15 13.10 15.70 21.65 27.95 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 23.85 30.80 | .75 .85 .95 1.55 2.75 3.35 5.00 7.60 9.80 11.60 13.45 15.80 19.005 33.65 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 8.25 10.65 12.60 14.60 17.15 20.75 28.25 36.50 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 8.90 11.50 13.60 15.75 18.50 22.50 30.45 39.35 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 19.85 24.25 32.65 42.20 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.20 22.55 27.50 37.05 47.90 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 1364 1194 |
| 1½ 2½ 3½ 3½ 4½ 5 6 7 8 9 10 12 14 16 18 | .555 .655 .755 1.155 1.955 2.35 2.75 3.40 5.00 6.40 7.60 8.85 10.40 12.75 17.25 22.25 22.25 28.25 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 3.80 5.65 7.25 8.60 10.00 11.75 14.00 19.45 25.00 32.00 | .65 .75 .85 1.35 2.35 2.85 2.85 3.35 4.20 6.30 8.10 9.60 11.15 13.10 15.70 21.65 27.95 35.75 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 23.85 30.80 39.50 | .75 .85 .95 1.55 2.75 3.35 5.90 7.60 9.80 11.45 15.80 19.00 26.05 33.65 43.25 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 10.65 12.60 14.60 17.15 20.75 28.25 36.50 47.00 | .85 .95 1.05 2.45 3.15 3.85 5.80 8.90 11.50 13.675 18.50 22.50 30.45 39.35 50.75 | .90 1.00 1.10 1.85 2.60 3.35 4.10 9.55 12.35 14.60 19.85 24.25 32.65 32.65 32.65 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.20 22.55 27.50 37.05 47.90 62.00 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 1364 1194 1061 |
| 1 ½ 2 ½ 2 ½ 3 ½ 4 ½ 5 6 7 8 9 10 112 114 116 118 20 | .555 .655 .755 1.155 1.555 2.355 2.750 3.406 7.600 8.855 10.40 12.75 17.25 22.25 23.35 23. | .60 .70 .80 1.25 1.70 2.15 2.60 3.85 3.80 5.65 7.25 8.60 10.00 11.75 14.00 19.45 25.00 32.00 38.25 | .65 .75 .85 1.35 2.35 2.85 3.35 4.20 6.30 8.10 9.60 91.65 27.95 35.75 42.75 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 23.85 30.80 39.50 47.25 | .75 .85 .95 1.55 2.75 3.35 5.90 7.60 9.80 11.60 9.80 11.45 19.00 26.05 33.65 43.25 51.75 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 8.25 10.65 12.60 17.15 20.75 28.25 36.50 47.00 56.25 | .85 .95 1.05 2.45 3.15 3.85 4.55 5.80 8.90 11.50 13.60 22.50 30.45 39.35 50.75 60.75 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 9.55 12.35 14.60 19.85 24.25 32.65 42.20 54.50 65.25 | 1.00 1.10 1.20 2.05 2.99 3.75 4.60 5.45 7.00 19.20 19.20 37.05 47.90 62.00 74.25 | Minute 19099 1273 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 1364 1194 1061 955 |
| 1 ½ 2 ½ 3 ½ 4 ½ 5 6 7 8 9 10 12 14 16 18 20 22 | .555 .655 .755 1.155 1.555 2.35 2.75 3.400 6.40 7.60 8.85 10.40 7.60 8.85 10.25 22.25 28.25 28.25 28.25 33.75 43.00 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 5.65 7.25 8.60 10.00 11.75 14.00 19.45 25.00 32.00 38.25 49.00 | .65 .75 .85 1.35 1.85 2.35 2.85 3.35 4.20 6.30 8.10 9.60 11.15 13.70 21.65 27.95 35.75 55.00 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 23.85 30.80 39.50 47.25 61.00 | .75 .85 .95 1.55 2.75 3.35 5.00 7.60 9.80 11.45 15.80 19.00 26.05 33.65 51.75 67.00 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 10.65 12.60 17.15 20.75 28.25 36.50 47.00 56.25 73.00 | .85 .95 1.05 2.45 3.15 3.85 4.55 5.80 11.50 13.60 15.75 18.50 22.50 30.45 39.35 50.75 79.00 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 54.25 32.65 42.20 54.50 65.25 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.255 27.50 37.05 47.90 62.00 74.25 97.00 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 1364 1194 1061 955 868 |
| 1½ 2 2½ 3½ 4 4½ 5 6 7 8 9 10 12 14 16 18 20 22 24 | .555 .655 .755 1.155 1.95 2.35 2.75 3.400 5.00 7.60 8.85 10.40 7.60 8.85 10.25 22.25 28.25 33.75 43.00 50.00 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 5.65 7.25 8.60 10.00 11.75 14.00 32.00 38.25 49.00 57.00 | .65 .75 .85 1.35 2.35 2.85 3.35 4.20 6.30 8.10 9.60 11.15 13.10 21.65 27.95 35.75 42.75 64.00 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 23.85 30.80 39.50 47.25 61.00 71.00 | 75 .85 .95 1.55 2.75 3.35 3.95 5.00 9.80 11.60 13.45 15.80 19.00 33.65 43.25 67.70 78.00 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 8.25 10.65 12.60 14.60 17.15 20.75 28.25 36.50 47.00 56.25 73.00 | .85 .95 1.05 1.75 2.45 3.15 3.85 4.55 5.80 11.50 13.60 15.75 18.50 22.50 30.45 39.35 50.75 60.75 79.00 92.00 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 54.25 32.65 42.20 54.50 65.25 85.00 99.00 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.20 22.55 27.50 37.05 47.90 62.00 74.25 97.00 113.00 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 1364 1194 1061 955 868 796 |
| 1½2 2½3 3½4 4½5 67 8 9 10 12 14 16 18 20 22 | .555 .655 .755 1.155 1.555 2.35 2.75 3.400 6.40 7.60 8.85 10.40 7.60 8.85 10.25 22.25 28.25 28.25 28.25 33.75 43.00 | .60 .70 .80 1.25 1.70 2.15 2.60 3.05 3.80 5.65 7.25 8.60 10.00 11.75 14.00 32.00 38.25 49.00 67.00 | .65 .75 .85 1.35 2.35 2.85 2.85 3.35 4.20 6.30 8.10 9.60 9.60 11.15 13.10 15.70 21.65 27.95 35.75 42.75 55.00 64.00 75.00 | .70 .80 .90 1.45 2.00 2.55 3.10 3.65 4.60 6.95 8.95 10.60 12.30 14.45 17.40 23.85 30.80 39.50 47.25 61.00 | .75 .85 .95 1.55 2.75 3.35 5.00 7.60 9.80 11.45 15.80 19.00 26.05 33.65 51.75 67.00 | .80 .90 1.00 1.65 2.30 2.95 3.60 4.25 5.40 10.65 12.60 17.15 20.75 28.25 36.50 47.00 56.25 73.00 | .85 .95 1.05 2.45 3.15 3.85 4.55 5.80 11.50 13.60 15.75 18.50 22.50 30.45 39.35 50.75 79.00 | .90 1.00 1.10 1.85 2.60 3.35 4.10 4.85 6.20 9.55 12.35 14.60 16.90 54.25 32.65 42.20 54.50 65.25 | 1.00 1.10 1.20 2.05 2.90 3.75 4.60 5.45 7.00 10.85 14.05 16.60 19.255 27.50 37.05 47.90 62.00 74.25 97.00 | Minute 19099 12733 9549 7639 6366 5457 4775 4244 3820 3183 2728 2387 2122 1910 1592 1364 1194 1061 955 868 |

CARBORUNDUM AND EMERY WHEELS

| | | | | CYLIN | DER | | | | | | |
|--------------------|--------------|--|----------------|----------------|----------------|----------------|-----------------|-----------------|--------------------|--|--|
| DIMENSIONS, INCHES | | THICKNESS, INCHES | | | | | | | | | |
| Diameter | Helght | 1 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | tions pe Minute | | |
| 8 | 7 | 15.50 | | | | | | •••• | 1425 | | |
| 9 | 7 | 16.50 | 22.00 | | | | | | 1275 | | |
| 10 | 7 | 17.75 | 24.25 | 29.50 | | . : : : : | | | 1150 | | |
| 12 | 7 | 18.75 | 26.25 | 33.00 | 38.75 | 44.00 | | | 950 | | |
| 14 | 7 | 22.50 | 31.00 | 38.50 | 45.50 | 51.50 | 57.50 | 61.50 | 825 | | |
| 16 | 7 | 26.00 | 35.75 | 44.60 | 53.00 | 60.25 | 67.60 | 73.00 | 725 | | |
| 18 | 7 | 28.80 | 40.25 44.00 | 51.40 | 61.40 | 71.00 | 79.00 | 86.90 | 625 | | |
| 20 22 | 7 7 | 30.90 | 49.75 | 56.25 65.00 | 67.40 | 78.50 91.50 | 87.60 103.90 | 97.00 115.50 | 575 525 | | |
| 24 | , | 37.50 | 54.25 | 70.50 | 79.40 86.25 | 99.50 | 113.60 | 126.60 | | | |
| 24 | | 1 31.00 | 04.20 | - 10.50 CU | | 00.00 | 110.00 | 120.00 | 410 | | |
| | | | | | P | | | r | | | |
| 8 | 5 | 14.15 | 30.10 | | | | | | • • • • | | |
| 9 | 5 | 15.65 | 20.10 | 30.55 | | • • • • • | | | • • • • | | |
| 10 | 5 | 17.30 | 22.90 | 26.75 | 34.95 | 97 10 | | | •••• | | |
| 12 | 5 5 | 19.75 26.80 | 26.45 | 32.20 39.25 | | 37.10 45.40 | 50.05 | 50.00 | • • • • | | |
| 14 | 5 5 | 33.65 | 32.05 38.45 | 45.90 | 42.50 | 54.80 | 50.05 60.60 | 50.90 | • • • • | | |
| 16 18 | 5 5 | 40.00 | 51.00 | 56.20 | 50.80 60.65 | 64.75 | 72.40 | 62.75 76.55 | • • • • | | |
| 20 | 5 | 46.60 | 59.95 | 65.20 | 70.40 | 75.55 | 83.25 | 86.70 | • • • • | | |
| 22 | 5 | 54.25 | 70.70 | 78.45 | 85.25 | 90.40 | 101.60 | 106.35 | • • • • | | |
| 24 | 5 | 63.80 | 82.40 | 88.65 | 96.80 | 103.10 | 116.30 | 121.25 | •••• | | |
| 8 | 6 | 16.35 | 02.10 | | | | | | •••• | | |
| ğ | 6 | 18.00 | 23.25 | | | | | | | | |
| 10 l | 6 | 19.85 | 26.35 | 30.95 | | | | | | | |
| 12 | 6 | 22.45 | 30.20 | 36.90 | 40.50 | 43.40 | | | • • • • | | |
| 14 | 6 | 30.00 | 36.50 | 44.75 | 49.00 | 52.75 | 58.25 | 59.70 | | | |
| 16 | 6 | 37.35 | 43.55 | 52.25 | 58.35 | 63.40 | 70.25 | 73.20 | • • • • | | |
| 18 | 6 | 44.10 | 56.75 | 63.55 | 69.40 | 74.90 | 83.70 | 88.95 | | | |
| 20 | 6 | 51. 0 0 | 66.25 | 73.25 | 80.05 | 86.75 | 95.75 | 100.55 | | | |
| 22 | 6 | 59.25 | 77.80 | 87.75 | 96.60 | 103.45 | 116.45 | 122.85 | • • • • | | |
| 24 | 6 | 69.15 | 90.15 | 98.70 | 109.10 | 117.30 | 132 .55 | 139.35 | • • • • | | |
| 8 | 7 | 18.55 | | | | | | | • • • • | | |
| 9 | 7 | 20.35 | 26.35 | | | | | | • • • • | | |
| 10 | 7 | 22.35 | 29.80 | 35.15 | ::-:: | ::.:: | | | • • • • | | |
| 12 | 7 | 25.10 | 33.95 | 41.60 | 46.00 | 49.65 | ::::: | | • • • • | | |
| 14 | 7 | 33.20 | 40.90 | 50.25 | 55.50 | 60.10 | 66.45 | 68.45 | • • • • | | |
| 16 | 7 | 41.05 | 48.65 | 58.60 | 65.90 | 72.00 | 79.90 | 83.60 | • • • • | | |
| 18 | 7 | 48.20 | 62.50 | 70.85 | 78.15 | 85.00 | 94.95 | 101.35 | • • • • | | |
| 20 | 7 | 55.40 | 72.50 | 81.25 | 89.65 | 97.95 | 108.25 | 114.40 | • • • • | | |
| 22 24 | 7 7 | 64.25 | 84.90 | 97.00 | 107.90 | 116.50 | 131.25 | 139.35 | • • • • | | |
| | 8 | | 97.90 | 108.75 | 121.40 | 131.50 | 148.75 | 157.40 | • • • • | | |
| 8 9 | 8 | $\begin{bmatrix} 20.80 \\ 22.75 \end{bmatrix}$ | 90.50 | · · · · · | • • • • • • | • • • • • | | | • • • • | | |
| 10 | 8 | 24.90 | 29.50 33.30 | 39.40 | • • • • • • | • • • • • | • • • • • | ••••• | • • • • | | |
| 12 | 8 | 27.80 | 37.70 | 46.35 | 51.55 | 55.95 | | | •••• | | |
| 14 | 8 | 36.45 | 45.35 | 55.75 | 62.00 | 67.50 | 74.70 | 77.25 | • • • • • | | |
| 16 | 8 | 44.80 | 53.80 | 65.00 | 73.50 | 80.65 | 89.60 | 94.05 | •••• | | |
| 18 | 8 | 52.35 | 68.25 | 78.20 | 86.95 | 95.15 | 106.25 | 113.80 | •••• | | |
| 20 | 8 | 59.85 | 78.80 | 89.3 0 | 99.30 | 109.20 | 120.80 | 128.30 | • • • • | | |
| 22 | 8 | 69.25 | 92.05 | 106.30 | 119.25 | 129.60 | 146.10 | 155.85 | • • • • | | |
| 24 | 8 | 79.90 | 105.65 | 118.85 | 133.75 | 145.75 | 165.00 | 175.50 | | | |

The above lists on carborundum cup wheels apply to wheels with standard backs. For other sizes of carborundum cup wheels the list is found by adding to the list price of a cylinder of the same dimensions, the list price of a regular solid wheel whose diameter is the inside diameter of the cylinder or diameter of back and thickness of back.



CARBORUNDUM STONES AND SLIPS

STYLE OF PACKAGES

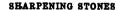






Fig. 6397A

Fig. 6397B

The Indian Head special trade-mark adopted by The Carborundum Company appears upon the labels of all packages of specialties of their manufacture. It is the "hall mark" of excellence. Its presence indicates that the highest grade of materials and labor combine in the contents of the package to which it is affixed, and that no better goods may be had at any price.

SHARPENING STONES

| Grade | Number | Length | Width | Thick- ness | Price per Stone | Number | Length | Width | Thick- ness | Price per Stone | Number | Length Inches | Width | Thick- ness | Price per Stone |
|--------------|--------|--------|-------|----------------|--------------------|--------|--------|-------|----------------|--------------------|--------|------------------|-------|----------------|--------------------|
| FF (fine) | 115 | 8 | 2 | 1 | 1.00 | 124 | 6 | 2 | 5/8 | .60 | 139 | 4 | 11/2 | 1 | .55 |
| 180 (medium) | 116 | 8 | 2 | 1 | .80 | 125 | 6 | 2 | 5/8 | .45 | 140 | 4 | 11/2 | 1 | .40 |
| 120 (coarse) | 117 | 8 | 2 | 1 | .80 | 126 | 6 | 2 | 5/8 | .45 | 141 | 4 | 11/2 | 1 | .40 |
| FF (fine) | 118 | 8 | 2 | 3/4 | .80 | 127 | 6 | 11/2 | | .65 | 142 | 4 | 11/2 | 1/2 | .40 |
| 180 (medium) | 119 | 8 | 2 | 3/4 | .60 | 128 | 6 | 11/2 | 1 | .50 | 143 | 4 | 11/2 | 1/2 | .30 |
| 120 (coarse) | 120 | 8 | 2 | 3/4 | .60 | 129 | 6 | 11/2 | 1 | .50 | 144 | 4 | 11/2 | 1/2 | .30 |
| FF (fine) | 121 | 6 | 2 | 1 | .80 | 130 | 6 | 113 | 1/2 | .45 | 145 | 4 | 1 | 1/4 | .25 |
| 180 (medium) | 122 | 6 | 2 | 1 | .60 | 131 | 6 | 11/2 | | .35 | 146 | 4 | 1 | 1/4 | .20 |
| 120 (coarse) | 123 | 6 | 2 | 1 | .60 | 132 | 6 | 11/2 | 1/2 | .35 | 147 | 4 | 1 | 1/4 | .20 |

SLIP STONES



Fig. 6397C

| Number | Grade | Length Inches | Width Inches | Thickness Inches | Price per Stone |
|--------|--------------|------------------|---------------------------|---------------------|--------------------|
| 174 | FF (fine) | G | $\overline{2}$ | 5.8-36 | .70 |
| 175 | 180 (medium) | 6 | 2 | 5 8-3/6 | .55 |
| 176 | 120 (coarse) | 6 | 2 | 5 8 - 3 6 | .55 |
| 177 | FF (fine) | 6 | 11/2 | 3/8-1/8 | .65 |
| 178 | 180 (medium) | 6 | $11\frac{7}{2}$ | 3,3-1,8 | .50 |
| 179 | 120 (coarse) | 6 | $11\frac{7}{2}$ | 3 6-16 | .50 |
| 180 | FF (fine) | 4 | 2 2 | 5 8 - 37 | .50 |
| 181 | 180 (medium) | 4 | 2 | 5 8-376 | .35 |
| 182 | 120 (coarse) | 4 | 2 | 5 3-3% | .35 |
| 183 | FF (fine) | 4 | 11/2 | 3/4-1/8 | .45 |
| 184 | 180 (medium) | 4 | $\overline{1}\frac{1}{2}$ | 3/2-1/2 | .30 |
| 185 | 120 (coarse) | 4 | $\bar{1}$ | 3%-1% | .30 |

CARBORUNDUM COMBINATION STONES, ETC.

COMBINATION





Fig. 7673A



RAZOR HONE HOLDER

Fig. 7673B

COMBINATION STONES

These stones are designed especially for carpenters and mechanics. They are made with one face of coarse and one face of very fine grit. The coarse side can be used for sharpening dull tools and the fine side for giving required keen, lasting edge.

| Number | 108 | 109 | 110 | 111 | 112 |
|------------|------|-------|-------|-----------|------------|
| Sizeinches | | 6x2x1 | 7x2x1 | 5x15 8x34 | 4x11/2x5/8 |
| Priceeach | 1.25 | 1.00 | 1.15 | .75 | .50 |

RAZOR HONE HOLDERS

Designed to simplify the work of honing. The holder swinging between two pivot screws, tips slightly as the razor blade is drawn across it, thus keeping hone and blade in the same plane. Holder is a bronze casting highly polished. Made in two sizes.

2.00

RAZOR HONES

ROUND COMBINATION BENCH



Fig. 7673C

Fig. 7673D

RAZOR HONES

Made of extra fine handwashed carborundum powder. Unexcelled for fast cutting qualities and for producing a keen, lasting edge.

| Number 10 | 01 102 | 103 | 104 | 105 |
|--------------------------------|---|-------|------------------------------|------------------------------|
| Size inches 6x Price each 1 | $\frac{2x^5}{50}$, $\frac{4x1\frac{1}{2}x\frac{1}{2}}{75}$ | 4x2x½ | $3x1\frac{1}{4}x\frac{1}{2}$ | $8x2\frac{1}{2}x\frac{3}{4}$ |

ROUND COMBINATION BENCH STONES

The shape and size of this stone allows for the circular motion used by carpenters and mechanics in sharpening plane irons or wide chisels.

No waste space when this stone is used, all sharpening space being used. Furnished with or without a dust-proof, highly polished quartered oak box holder.

| Price, No. 107, Round Combination Stoneseach | 1.00 |
|--|------|
| " Quartered Oak Box Holders " | .50 |

CARBORUNDUM KNIFE SHARPENERS. ETC.



Fig. 9304B

ROUND KNIPE

Fig. 9304A **OCTAGONAL SHARPENERS**

Having eight flat surfaces, gives a shear cut, thus producing a keen edge in less time. It is a solid shaft of carborundum fitted with a stag or durable wooden handle.

| Price, No. 79, Genuine Stag Handle, in Satin Lined Boxeach | 1.00 |
|--|------|
| " " 78, with Wooden Handle" | .50 |

ROUND SHARPENERS

A solid shaft of carborundum, firmly secured to handle by a steel rod extending its entire length, giving it strength and durability.

Price, No. 76, Length Over All 12 incheseach

STAG HANDLE KNIFE SHARPENER

BUTCHERS' STEEL

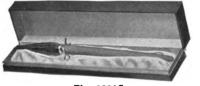




Fig. 9304C

Fig. 9304D

STAG HANDLE KNIFE SHARPENERS

These have a steel rod extending through the center, the entire length of the shaft, and is screwed into the stag handle, giving the shaft a greater strength. The handle is the very best imported stag horn, highly polished, put up in an attractive green box, lined with white satin.

| Price, No. 77, Length Over All 12 incheseach | 75 |
|--|--------|
| Tire, No. 11, Dength Over An 12 menes | 1 . 10 |
| | |

BUTCHERS' STEELS

A solid shaft of carborundum of even grit and surface. Puts a keen edge on all kinds of knives and lessens the need of a grindstone.

| | | | | | |
|-------------|-----------------|---------------|------|------|------|
| Price, with | ı Swivel Hook . | . | | each | 1.00 |



Fig. 9304E

Very useful for sharpening the penknife or ink scratcher. Furnished in neat leather case, convenient size for pocket.

| Number | | 145 14 | 16 |
|----------------|--------|-------------|-----------|
| Size | inches | 4x1x1/4 4x1 | x 1/4 |
| Grade Price | each | Fine Med | ium 35 |

EMERY WHEEL DRESSERS

DIAMOND TURNING TOOLS



Fig. 5821B

| No | . 1. l | dane | d, for W | hee | ls 6x3 | 4 ins. and smaller, No. 60 Emery and Fineres | ch a | 5.00 |
|----|--------|------|----------|------|--------|---|--------|------|
| " | 2, | 44 | "" | 44 | 6x1 | to 8x1½ ins., "60 " " " | " 8 | 8.00 |
| " | 3, | " | or Lat | he, | for W | Theels $8x2$ to $10x2$ ins, No. 60 Emery and Finer | " 10 | 0.00 |
| 66 | 4, | 64 | 66 66 | • | 44 | | " 15 | 2.00 |
| ٠. | 5, | 44 | " | • | 44 | " $10x2\frac{1}{2}$ to $12x2$ ins., No. 36 Emery and Finer | " 18 | 5.00 |
| " | 6, | 46 | Lathe | , or | Adj., | for Wheels 12x21/2 to 16x2 ins., No. 36 Emery and Finer | " 18 | 8.00 |
| " | 7. | 46 | 46 | 64 | " | " " $16x2\frac{1}{2}$ " $20x2$ " " 36 " " " | " 20 | 0.00 |
| 46 | 7 x | " | 46 | " | " | same as No. 1, with Darger Carbon Foint | " 2 | 5.00 |
| 44 | 8, | 44 | 44 | 66 | 46 | for Wheels $20x2\frac{1}{2}$ to $24x2$ ins., No. 36 Emery and Finer | " 30 | 0.00 |
| 44 | | 46 | 66 | " | ** | " $24 \times 21 \times 20 \times 4$ " " 36 " " " | " 3 | 5.00 |
| 66 | 10. | " | 44 | " | 66 | " Extra Hard Corundum Wheels, 10x1 to 24x21/2 | | |
| | • | | | | | ms., Nos. 50, 50, 40 and 60 | " 30 | 0.00 |
| 66 | 11, | 66 | 66 | 66 | " | " Corundum Wheels 18x21/2 to 36x4 inches | " 40 | 0.00 |
| | 12, | " | 66 | 66 | " | " Hard, Coarse Wheels 12x2 ins. and Smaller, | | |
| | • | | | | | | " 2 | 5.00 |

HUNTINGTON

DESMOND DIAMO-CARBO

Fig. 5821E



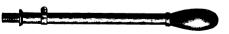


Fig. 5821D

HUNTINGTON

| Price, Huntington, with two Sets of Cutterseach | 2.50 |
|---|--------|
| " Extra Cutters per set | : .30 |
| " Star, with one Extra Set of Cutters each | .75 |
| " Extra Cutters per set | |

DESMOND DIAMO-CARBO

| Number | 3 | 5 |
|---------------|------|------|
| Tength inches | 10 | 12 |
| Priceeach | 3.50 | 4.00 |



| | | | | === | | |
|-------|-------------|---------|------|-------------|------|------|
| Price | . . | | | | each | 3.50 |



FLINT AND SAND PAPER. ETC.

FLINT PAPER REAMS

| Numbers | 9 x 11 in. | Numbers | 9 x 11 in. | Numbers | 9 x 11 in. |
|---------|------------|---------|------------|----------|------------|
| 000 | 6.25 | 1 | 6.75 | 3 | 9.50 |
| 00 | 6.25 | 1½ | 7.25 | 31/2 | 10.75 |
| 0 | | 2 | 7.75 | 4 | 11.75 |
| 1/6 | 6.25 | 21/2 | 8.25 | Assorted | 7.25 |

STAR SAND PAPER REAMS

| Numbers | 834 x 101/2 in. | Numbers | 8% x 10% in. | Numbers | 8% x 10% in. |
|----------|-----------------|---------|--------------|----------|--------------|
| 00 | | 1 | | 21/2 | |
| 0 | | 11/2 | | 3 | |
| ½ | 4.25 | 2 | 4.75 | Assorted | 4.75 |

EXTRA FLINT PAPER ROLLS

| Numbers | 24 in. | 30 in. | 36 in. | 40 in | 42 in | . 48 in. | Numbers | 24 in. | 30 in. | 36 in. | 40 in. | 42 in. 4 | 8 in. |
|--------------------|--------|--------|--------|-------|-----------|----------|----------------|--------|--------|--------|--------|----------|-------|
| 00 | | | | | | | | 8.50 | 10.50 | 12.50 | 14.75 | 15.751 | 9.25 |
| 0 | 6.75 | 9.00 | 11.00 | 13.2 | 5'14.25 | 5.16.50 | $2\frac{1}{2}$ | | | | | 16.50 2 | |
| ½ | 6.75 | 9.00 | 11.00 | 13.2 | 5 14 . 28 | 5,16.50 | 3 | | | | | 18.002 | |
| í | 7.25 | 9.00 | 11.50 | 13.7 | 5,14.76 | 5 18.00 | $3^{1}2\cdots$ | | | | | 20.002 | |
| $1_{2}^{1} \cdots$ | 7.75 | 10.00 | 12.00 | 14.2 | 5 15.25 | [18.50] | 4 | 12.25 | 16.50 | 18.75 | 22.00 | 23.00 2 | 9.00 |

SAND CLOTH ROLLS

| Numbers | 14 in. | 28 in. Nt | imbers | 14 in. | 28 in. |
|---------|--------|-----------------------|----------|--------|--------|
| 00 | 12.00 | 24.00 11 | ½ | 13.75 | 27.50 |
| 0 | 12.00 | $124.00 \parallel 2.$ | | 14.50 | 29.00 |
| 1/6 | | 24.00 21 | % | 15.50 | 31.00 |
| 1, | 13.00 | 26.00 3 | ½ | 16.50 | 33.00 |

EMERY PAPER

| Numbers | Reams 9 x 11 in. | Rolls 24 in. | Numbers | Reams 9 x 11 in. | Rolls 24 in. |
|----------------------|---------------------|-----------------|------------------|---------------------|-----------------|
| 00 | 10.25 10.25 | 11.00 | 2 | 13.50 | 13.75 |
| 1/3 | 10.25 | 11.00 | 3 | 18.25 | 19.25 |
| 1 11 ₉ | $12.00 \ 12.75$ | 12.75 13.25 | 3½ Assorted | 21.25 12.75 | 22.00 |

EMERY CLOTH REAMS

| | = = | | | | 9 x 11 in, |
|--------|-------|-----|-------|----------|------------|
| Crocus | 26.50 | 1/2 | 26.50 | 21/2 | 33.00 |
| 000 | 26.50 | 1 | 28.50 | 3 | 35.25 |
| 00 | 26.50 | 116 | 29.75 | 31/4 | 37 50 |
| 0 | 26.50 | 2 | 30.75 | Assorted | 28.59 |
| 100 | 26.50 | · | 1 | | |

ROLLS

| Numbers | | | | | | 18 in. | |
|---------|-------|-------|-------|---------------------------------|-------|--------|-------|
| 00 | 9.25 | 18.50 | 27.75 | 1½ | 11.00 | 22.00 | 33.0u |
| 0 | 9.25 | 18.50 | 27.75 | 2 | 11.50 | 23.00 | 34.50 |
| 100 | 9.25 | 18.50 | 27.75 | $2\frac{1}{2}$ | 12.00 | 24.00 | 36.00 |
| 1/2 | +9.25 | 18.50 | 27.75 | 3 | 13.25 | 126.50 | 39.75 |
| 1 | 10.50 | 21.00 | 31.50 | $ \ 3\frac{1}{2} \dots \dots $ | 14.25 | 28.50 | 42,75 |

GARNET PAPER

REAMS

| Numbers | 9 x 11 in. | Numbers | 9 x 11 in. | Numbers | 9 x 11 in |
|---------|------------|----------------|------------|-----------------|-----------|
| 000 | 6.50 | 1/2 | 6.50 | 2 | 8.00 |
| 00 | 6.50 | 1 | 7.00 | $12\frac{1}{3}$ | 8.50 |
| 0 | 6.50 | $1\frac{1}{2}$ | 7.50 | 3 | 9.75 |

ROLLS-50 Yards Long

| Numbers | 24 in. | 30 in. | 36 in. | 40 in. | 42 in. | 48 in. |
|---------|--------|--------|--------|--------|--------|--------|
| 00 | 7.50 | 9.75 | 12.00 | 14.00 | 16.25 | 20.00 |
| 0 | 7.50 | 9.75 | 12.00 | 14.00 | 16.25 | 20.00 |
| 1/2 | 7.50 | 9.75 | 12.00 | 14.00 | 16.25 | 20.00 |
| 1 | 7.75 | 10.25 | 12.50 | 14.50 | 16.75 | 21.00 |
| 11/2 | 8.00 | 10.75 | 13.00 | 15.25 | 17.25 | 21.50 |
| 2 | 8.50 | 11.25 | 13.50 | 15.75 | 17.75 | 22.00 |
| 2½ | 9.25 | 12.00 | 14.00 | 16.25 | 18.25 | 23.75 |
| 3 | 10.25 | 13.00 | 15.25 | 17.25 | 20.00 | 27.00 |

GARNET CLOTH ROLLS-50 Yards Long

| Numbers | 14 in. | Numbers | 14 in. | Numbers | 28 in. | Numbers | 28 in. |
|---------|--------|---------|--------|----------------|--------|----------------|--------|
| 0 | 14.00 | 2 | 16.00 | 0 | 28.00 | 2 | 32.00 |
| 1/2 | 14.00 | 2½ | 16.50 | 1/2 | 28.00 | $2\frac{1}{2}$ | 33.00 |
| 1 | 15.00 | 3 | 17.00 | 1 | 30.00 | 3 | 34.00 |
| 1½ | 15.50 | l | | $ 11_2,\ldots$ | 31.00 | | |

EMERY

| | GR | FLOUR | |
|--------------------------------------|----------------------------|------------------------------|-----------------------|
| | Nos. 4 to 46, inclusive | Nos. 54 to 180, inclusive | C. F. F. and F. F. |
| In Kegs of about 300 poundsper pound | .05 | .051/2 | .031/2 |
| 1/4 "" " 135 "" " | .051/4 | .0534 | .0334 |
| 14 " " " 75 " " | .05½ | .06 | .04 |
| 10-pound Tin Cans, 10 in Case " | .061/2 | .07 | .06 |
| Less quantity " | .10 | .10 | .08 |

Crocus at same prices as fine grades.

CORUNDUM

| | Nos. 4 to 46, inclusive | Nos. 54 to 180, inclusive | Flour |
|--------------------------------------|----------------------------|------------------------------|-------|
| In Kegs of about 275 poundsper pound | .15 | .12 | .06 |
| 1/4 "" " 135 " " | .16 | .14 | .08 |
| 12 " " " 50 " " | .18 | .16 | .10 |
| 10-pound Cans | .20 | .18 | .12 |

POLISHING COMPOSITION AND METAL POLISH

| Liquid | Metal | Polish | 1Gal. | Cans | Tripoli | |
|--------|-------|--------|-------------|------|-------------------|--|
| ٠. | ** | 66 | 1/2 " | 66 | Crocus | |
| 64 | 44 | 66 | \dots Qt. | 44 | XXX White | |
| 66 | " | 66 | Pt. | 44 | Acme White | |
| Paste | 44 | 66 | 5-lb. | 66 | Hard Nickel Rogue | |
| 44 | 44 | 46 | 1-lb. | | | |



POLISHING WHEELS

LOOSE CANVAS WHEELS







Fig. 434A

MUSLIN CLOTH POLISHING WHEELS

Fig. 434B

| Diameter Inches | THICKNESS, INCHES | | | | | | | | | | | | |
|--------------------|-------------------|----------------|-------|----------------|-------|-------|-------|--|--|--|--|--|--|
| | 1 | $1\frac{1}{2}$ | 2 | $2\frac{1}{2}$ | 3 | 31/2 | 4 | | | | | | |
| 8 | 1.00 | 1.50 | 2.00 | 2.40 | 2.80 | 3.20 | 3.50 | | | | | | |
| 10 | 1.10 | 1.60 | 2.10 | 2.50 | 3.10 | 3.60 | 4.00 | | | | | | |
| 12 | 1.50 | 2.25 | 3.00 | 3.60 | 4.50 | 5.00 | 5.50 | | | | | | |
| 14 | 2.00 | 3.00 | 3.90 | 4.80 | 5.70 | 6.50 | 7,25 | | | | | | |
| 15 | 2.30 | 3.40 | 4.50 | 5.60 | 6.60 | 7.50 | 8.40 | | | | | | |
| 16 | 2.75 | 4.10 | 5.40 | 6.70 | 8.00 | 9.25 | 10.25 | | | | | | |
| 18 | 3.75 | 5.60 | 7.40 | 9.20 | 11.00 | 12.50 | 14.00 | | | | | | |
| 20 | 5.00 | 7.50 | 10.00 | 12.50 | 14.50 | 16.50 | 18.50 | | | | | | |

IMPROVED CANVAS WHEELS

| Diameter Inches | THICKNESS, INCHES | | | | | | | | | | | |
|--------------------|-------------------|------|-------|-------|-------|-------|-------|--|--|--|--|--|
| | 1 | 11/2 | 2 | 21/2 | 3 | 31/2 | 4 | | | | | |
| 6 | 1.00 | 1.25 | 1,50 | 1.75 | | | ***** | | | | | |
| 8 | 1.75 | 2.25 | 2.75 | 3.25 | 3.75 | | | | | | | |
| 10 | 2.25 | 2.75 | 3.25 | 3.75 | 4.50 | | | | | | | |
| 12 | 2.50 | 3.50 | 4.50 | 5.50 | 6.50 | 7.50 | 8.50 | | | | | |
| 14 | 3.50 | 4.75 | 6.25 | 7.00 | 8.25 | 9.00 | 10.00 | | | | | |
| 16 | 4.50 | 5.75 | 7.50 | 8.50 | 10.50 | 12.50 | 14.50 | | | | | |
| 18 | 5.50 | 7.00 | 9.50 | 11.25 | 13.00 | 15.00 | 18.00 | | | | | |
| 20 | 6.75 | 8.50 | 11.75 | 14.00 | 17.00 | 20.00 | 24.00 | | | | | |

BLEACHED AND UNBLEACHED MUSLIN BUFF WHEELS No. 1 Quality, 18-Ply

| Size inches | 2 | 3 | 4 | 41/2 | 5 | 6 | 7 | 71/2 | 8 |
|-----------------------|------|------|------|------|------|------|------|------|------|
| Priceper 100 sections | 1.65 | 2.30 | 3.00 | 4.00 | 5.00 | 5.75 | 7.70 | 8.80 | 9.90 |
| Size inches | 81/2 | 9 | 10 | 12 | 13 | 14 | 15 | 16 | 18 |
| Priceper 100 sections | | | | | | | | | |

No. 2 Quality, 18-Ply

| Size inches | 2 | 3 | 4 | 41/2 | 5 | 6 | 7 | 71/2 | 8 |
|-----------------------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Priceper 100 sections | 1.37 | 2.10 | 2.75 | 3.65 | 4.55 | 5.25 | 6.87 | 7.95 | 9.05 |
| Size inches | | | | | | | | | |
| Priceper 100 sections | 9.70 | 10.45 | 13.85 | 17.87 | 22.25 | 24.25 | 29.70 | 32.70 | 39.60 |

No. 3 Quality, 18-Ply

| Size inches | 2 | 3 | 4 | 41/2 | 5 | 6 | 7 | 71/2 | 8 |
|-----------------------|------|------|-------|-------|-------|-------|-------|-------|-------|
| Priceper 100 sections | 1.10 | 1.65 | 2.20 | 2.90 | 3.63 | 4.10 | 5.50 | 6.20 | 6.87 |
| Sizeinches | 81/2 | 9 | 10 | 12 | 13 | 14 | 15 | 16 | 18 |
| Priceper 100 sections | 7.60 | 8.25 | 11.00 | 13.20 | 17.60 | 18.70 | 22.00 | 24.20 | 31.90 |

WETMORE GLUE HEATERS

COPPER AND BRASS For Steam, Gas, or Electricity

MODEL A

MODEL C

MODEL E-2

MODEL P-1





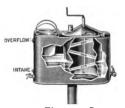




Fig. 5599A

Fig. 5599B

9B Fig. 5599C MODELS A AND C

Fig. 5599D

| Capacity gallons | 2 | 3 | 5 | 10 | 15 | 20 |
|--|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Price, Steam each " Pure Water Chamber " Stand " Gas Water Heaters " | 33.00 5.00 4.00 14.00 | 37.00 5.00 4.00 14.00 | 44.00 6.00 4.00 14.00 | 55.00 7.00 4.00 16.00 | 67.00 7.50 5.00 18.00 | 80.00 8.00 5.00 24.00 |
| " Electric Coils " Capacity gallons | 26.00 | 30 | 35 | 50 | 87.00 75 | 109.00 |
| | | | | | | |
| Price, Steam each | 96.00 | 114.00 | 128.00 | 156.00 | 210.00 | 265.00 |
| " Pure Water Chamber " | 9.00 | 10.00 | 12.00 | 18.00 | 24.50 | 32.00 |
| " Stand " | 5.00 | 6.00 | 6.00 | 7.00 | 8.00 | 8.00 |
| " Gas Water Heaters " | 26.00 | 32.00 | 35.00 | 60.00 | 100.00 | 125.00 |
| " Electric Coils " | 131.00 | 157.00 | Special p | rices on a | pplication | |

The Model A is the standard model. Model C is the same as Model A but is supplied with Warming Chamber and as many Pots as its diameter will accommodate.

Price additional, for Warming Chamber and Pots, given above.

The above models are usually applied to steam. When gas heater is wanted always state whether natural or artificial gas is to be used. Prices quoted include pipe and connections to supply pipe.

| MODEL E | -2 | | | |
|--|--------------|--------------|----------------|----------------|
| Capacity | | gallons | $\overline{2}$ | 3 |
| Price, Fitted for Steam | | each | 41.50 47.50 | 45.00 51.00 |
| MODEL F | P-1 | | | |
| Capacity of Potsquarts | 1 | 2 | 3 | 4 |
| Price, Fitted for Steameach " with Gas Burner and Apron" | 5.50 7.00 | 6.00 8.00 | 6.50 9.00 | 7.00 10.00 |

The Model E-2 represents the newest design in this model, and is the most popular heater and warmer ever produced for the smaller consumer, embodying all the exclusive features found in the larger models.

The Model P-1 is an extra heavy copper individual pot warmer, for personal use at a distance from the glue heater, saving the time consumed by frequent trips to the central supply.

ADVANCE GLUE WARMERS. ETC.

FOR USE IN BATTERY

AT BENCHES OF WORKMEN

MODEL U-1



Fig. 5600A



Fig. 5600B

| *Capacity of Potsquarts | 1 | 2 | 3 | 4 | 6 | 8 |
|--------------------------------|---|---|---------------|---|---|---|
| Price, Model U-1each * " "U-2" | | | 7.05 14.10 | | | |

*Capacity Model U-2, double that of Model U-1, given above.

The jackets of these Models are of heavy gray iron, with large steam-chamber in the bottom, into which steam is introduced through a special brass valve, so constructed as to allow steam to enter at one end, pass into the steam chamber, make a complete circuit and pass out at the other end, going on to the next warmer, etc. Glue pots are extra heavy copper. PORTABLE WARMERS AND HEATERS

MODEL R

FITTED FOR GAS

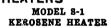




Fig. 5600C



Fig. 5600D

MODEL R WARMERS

| Capacity of Pots quarts | 1 | 2 | 3 | 44 | 6 | 8 |
|---------------------------|------|------|------|-------|-------|-------|
| Price, Fitted for Gaseach | | 8.00 | 9.00 | 10.00 | 12.00 | 14.00 |
| " " " Steam . " | 4.00 | 4.70 | 5.35 | 6.85 | | |

The Model R Cabinet Makers Portable Pot Warmer can be fitted for either natural or artificial gas. In ordering, always state which is to be used.

KEROSENE HEATERS

| Capacityquarts | 1 | 2 | 3 | 4 |
|----------------|------|------|------|-------|
| Priceeach | 7.00 | 8.00 | 9.50 | 10.60 |

Only extra heavy copper is used throughout in the construction of the Kerosene Heater, and it is in every way as substantial and produces as good results as the larger models.

GRINDSTONES



Fig. 4375A

KEYSTONE GRINDSTONES WITH IRON FRAME, FOR POWER

| No. | Diameter Inches | Thickness Inches | Size of Shaft at Bearing Inches | Diameter of Pulley Inches | Price Complete with Stone Each | Price of Frame with Shaft Pulley and Tool Rest | Price of Frame only without Shaft Bear- ings or Tool Rest |
|-------|--------------------|---------------------|--|---------------------------------|---|--|--|
| 508K | 50 | 716 to 8 | 134 | 12x4 | 80.00 | 52.00 | 35.00 |
| 506K | 50 | 51/2 " 6 | $13\frac{7}{4}$ | 12x4 | 70.00 | 52.00 | 35.00 |
| 488K | 48 | 71/2 " 8 | 134 | 12x4 | 75.00 | 52.00 | 35.00 |
| 486K | 48 | 51 2 " 6 | 112 | 12x4 | 68.00 | 52.00 | 35.00 |
| 485K | 48 | 412 " 5 | 112 | 12x4 | 66.00 | 52.00 | 35.00 |
| 466K | 46 | 512 " 6 | 112 | 12x4 | 67.00 | 52.00 | 35.00 |
| 465K | 46 | 412 44 5 | $1\frac{1}{2}$ | 12x4 12x4 | 65.00 | 52.00 | 35.00 |
| | | 51.5 " 6 | | 12x4 12x4 | | | |
| 406K | 40 | - | $\frac{11}{112}$ | | 51.00 | 39.00 | 28.00 |
| 405K | 40 | 1 4 2 0 | 11_4 | 12x4 | 49.00 | 39.00 | 28.00 |
| 386K | 38 | 512 " 6 | 11/4 | 12x4 | 50.00 | 39.00 | 28.00 |
| 385K | 38 | 412 " 5 | 1/4 | 12x4 | 48.00 | 39.00 | 28.00 |
| 366K | 36 | 51/2 " 6 | 114 | 12x4 | 49,00 | 39.00 | 28.00 |
| 365 K | 36 | 412 " 5 | $1\frac{1}{4}$ | 12x4 | 47.00 | 39.00 | 28.00 |
| 364K | 36 | 4 " 41/2 | 11/4 | 12x4 | 46.00 | 39.00 | 28.00 |
| 305K | 30 | 41.2 | 1 1 1 | 12x4 | 39.00 | 33.00 | 21.00 |
| 304 K | 30 | 4 | l î | 12x4 | 38.00 | 33.00 | 21.00 |
| 303K | 30 | 312 | ! î | 12x4 | 37.00 | 33.00 | 21.00 |
| | | 3 2 | 1 | 12x4 12x4 | | | |
| 302K | 3 0 | 1 0 | ' 1 | 12X4 | 36.50 | 33.00 | 21.00 |

A 12x4-inch pulley is furnished with all sizes of keystone frames. Any required size can be furnished, only the actual difference in price being charged.

Loose pulley, 12 inches in diameter 3.00 extra.

GRINDSTONES

All Stones Over 200 lbs. are Sold by Measurement Weight, Less than 200 lbs. by Actual Cut Weight

| | |
|-------|-------------------|
| Price | per pound .03 |
| | |



GRINDSTONES AND FIXTURES

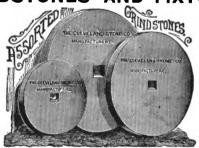


Fig. 1897A

| Weight pounds | 20 to 40 | 40 to 200 | 200 and over |
|-----------------|----------|-----------|--------------|
| Price per pound | | | |

All stones over 200 lbs. are sold by measurement weight. Less than 200 lbs. by actual cut weight.

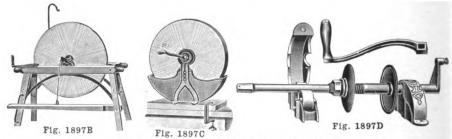
APPROXIMATE WEIGHT OF GRINDSTONES

| Thickness | Diameter, Inches | | | | | | | | | | |
|-------------------------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| Inches | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | | |
| 2 | 55 | 60 | 81 | 95 | 110 | 126 | 143 | 162 | 181 | | |
| 21/4 | 60 | 70 | 91 | 105 | 122 | 141 | 161 | 182 | 201 | | |
| 21/2 | 70 | 80 | 101 | 118 | 137 | 157 | 179 | 202 | 226 | | |
| $\frac{21}{2}$ $\frac{23}{4}$ | 80 | 90 | 110 | 130 | 151 | 173 | 197 | 222 | 249 | | |
| 3 | | 100 | 121 | 142 | 165 | 189 | 215 | 243 | 272 | | |
| 31/2 | | | 141 | 166 | 192 | 220 | 251 | 283 | 317 | | |
| 4 | | | 162 | 189 | 219 | 252 | 287 | 323 | 363 | | |

MOUNTED GRINDSTONE

FAMILY GRINDSTONE

GRINDSTONE FIXTURE



SAMSON MOUNTED GRINDSTONES

| No. 2. Weight 70 to 80 l | bs., 13/4 to 21/4 | inches thick | k, complete each | 5.00 |
|--------------------------|-------------------|--------------|------------------|------|
| No. 3. " 40 to 50 " | · 13/4 to 21/4 | | | 4.50 |

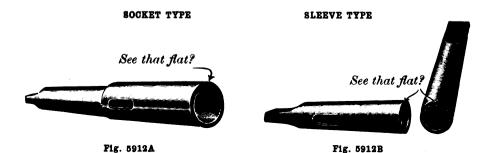
FAMILY GRINDSTONES

| Diameterinches | 7 | 8 |
|-----------------|------|-------|
| Price per dozen | 8.75 | 10.00 |

GRINDSTONE FIXTURES

| Size inches | 15 | 17 | 19 | 21 |
|----------------|------|------|------|------|
| Priceper dozen | 7.00 | 7.30 | 8.00 | 9.30 |

"USE-EM-UP" DRILL SOCKETS



SOCKET TYPE

| Number | 1-2 | 1-3 | 1-4 | 1-5 | 2-3 | 2-4 | 2-5 | 3–2 | 3–3 |
|---|----------------|----------------|----------------|----------------|----------------|--------------------|-----------------|--------------------|---------------------|
| Holenumber Shank fitted to Socket " Priceeach | $\overline{2}$ | | 1 4 3.20 | 1 5 4.80 | 2 3 2.50 | $\frac{2}{4}$ 3.20 | 2 5 4.80 | $\frac{3}{2}$ 3.20 | $\frac{3}{3}$ 3.20 |
| Number | 3-4 | 3-5 | 4-3 | 4-4 | 4-5 | 4-6 | 5-4 | 5–5 | 5-6 |
| Holenumber Shank fitted to Socket " Priceeach | 4 | 3 5 4.80 | 4 3 4.80 | 4 4 4.80 | 4 5 4.80 | 4 6 12.00 | 5 4 12.00 | 5 5 12.00 | $\frac{5}{6}$ 12.00 |

SLEEVE TYPE

| Number | 1-2 | 1-3 | 1-4 | 1-5 | 2-3 | 2-4 |
|---|----------------|----------------|--------------------|----------------|--|---|
| Hole number Fitted to Socket " Price each | | 1 3 2.40 | $\frac{1}{4}$ 3.00 | 1 5 4.40 | $\begin{bmatrix} 2 \\ 3 \\ 2.40 \end{bmatrix}$ | $\begin{array}{ c c }\hline 2\\4\\3.00\\ \end{array}$ |
| Number | 2-5 | 3-4 | 3-5 | 4-5 | 4-6 | 5-6 |
| Hole number Fitted to Socket " Price each | 2 5 4.40 | 3 4 3.00 | 3 5 4.40 | 4 5 4.40 | 4 6 10.00 | 5 6 10.00 |

"Use-Em-Up" Drill Sockets are intended for using up twist drills or reamers having broken shanks or twisted tangs.

These sockets will drive a drill where only three quarters of an inch of the shank remains. All that is necessary is to grind a flat surface on the remaining shank of the drill or reamer and put it to work.

When making boring bars the expense of milling a tang is unnecessary; simply flat one side and use the "Use-Em-Up" Socket.

MORSE STEEL SOCKETS

No. 100 FOR MORSE TAPER SHANK DRILLS



Fig. 6278A

| Number | 1 | 2 | 3 | 4 | 5 | 6 |
|--|----------|---------------|-----------------|----------------|---------|----------------------|
| Holds Drills (inclusive) inches Length Over All | 14 to 16 | 37 to 33 8 | 5% to 114 10 | 117 to 2 | 24 to 3 | 3 ₆₄ to 6 |
| Diameter Blank End " Length " " " | 1 16 | 114 | 11/2 53 | $\frac{12}{6}$ | 25 8 | 35 g 193 g |
| Priceeach | 1.20 | 1.80 | 2.50 | 4.00 | 7.50 | 14.00 |

No. 100A SOCKET

No. 100B SLEEVE





Fig. 6278B

Fig. 6278C

No. 100A STEEL SOCKETS FOR MORSE TAPER SHANK DRILLS

| Number | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 |
|---|---|-----------|------------------|-----------|-----------|--|-------------------|-------------------|------------|
| Shank fitted to Seeket number Price each | | 3 2.50 | 3 20 | 5 4.80 | 3 50 | 3 20 | 5 | 3 20 | 3 20 |
| Number | | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| Shank fitted to Socketnumber Priceeach | | 5 4.80 | $\frac{3}{4.80}$ | 4 4.80 | 5 4.80 | $\begin{array}{ c c }\hline 6\\12.00\end{array}$ | $\frac{4}{12.00}$ | $\frac{5}{12.00}$ | 6 12.00 |

No. 100B STEEL SLEEVES FOR MORSE TAPER SHANK DRILLS

| Number | 1 | 1 | 1 | 1 | 2 | 2 |
|----------------------------------|------------------|------------------|-----------|-----------|------------|------------|
| Fitted to Socketmumber Priceeach | $\frac{2}{1.80}$ | $\frac{3}{2.40}$ | 4 3.00 | 5 4.40 | 3 2.40 | 3.00 |
| Number | $\overline{2}$ | 3 | 3 | 4 | 4 | 5 |
| Fitted to Socketnumber Priceeach | 5 4.40 | 3.00 | 5 4.40 | 5 4.40 | 6 10.00 | 6 10.00 |

These sockets and sleeves can be furnished hardened and ground, inside and out, at special prices.

NO. 100C CENTER KEYS FOR SOCKETS AND SLEEVES



Fig. 6278D

| · == | | | | | | |
|--------------------------|------|------|----|-------|-----|----|
| Number | . 1 | 2 | 3 | 4 | . 5 | 6 |
| For Socket or Sleevenumb | ar | | 3 | 1 - 1 | 5 | 6 |
| Priceeac | h 30 | 35 | 40 | 50 | 60 | 75 |

MORSE SOCKETS AND LATHE CENTERS

No. 100D MORSE TAPER SOCKETS FOR OIL DRILLS



| | F | g. | 627 | 7A |
|--|---|----|-----|----|
|--|---|----|-----|----|

| Number | 1 | 2 | 3 | 4 | 5 |
|--|-------------|---------------|------------------|--|---------------------------------|
| Holds Drills (inclusive) inches Length Over All | 1/4 to 9/16 | 37 to 29 8 | 59 to 11/4 10 | $\frac{1_{64}^{17} \text{ to } 2}{12}$ | $\frac{2\frac{1}{64}}{16}$ to 3 |
| Diameter Blank End " Length " " " | 11/16 | 11/4 | 11/2 | 63/6 | 25/8 |
| Priceeach | 4.00 | 5.00 | 6.50 | $\frac{63}{8}$ 9.25 | 10.25 |

No. 100E MORSE TAPER SOCKETS FOR OIL DRILLS



| Number | | 1 | 2 | 2 | 3 | 4 |
|------------------------------|----------------|---------------|------|------|------|-------|
| Shank Fitted to Socketnumber | $\overline{2}$ | $\overline{}$ | 3 | 4 | 4 | 5 |
| Priceeach | 4.50 | 4.50 | 5.50 | 6.75 | 7.00 | 10.00 |

No. 100D and No. 100E Sockets are used with No. 102C Drills.

No. 100F LATHE SOCKETS



Fig. 6277C

| Number | 1 | 2 | 3 | 4 | 5 |
|--|------------------|------|------|------------------|-----------------------------------|
| Holds Material (inclusive) inches Price each | 1, to 16 1.20 | 1.80 | 2.50 | 117 to 2 4.00 | $2^{\frac{1}{64}}_{64}$ to 3 7.50 |

No. 100L LATHE CENTERS, MORSE TAPER SHANKS



Fig. 6277D

| Taper Shank Number | Price Each | Length Over All Inches | Length of Body Inches | Taper Shank Number | Price Each | Length Over All Inches | Length of Body Inches |
|-----------------------|---------------|------------------------------|-----------------------------|-----------------------|---------------|---|-----------------------------|
| 0 | 50 | 27/8 | 3/4 | 3 | 1.25 | $\begin{array}{c} 514 \\ 634 \\ 81/2 \end{array}$ | 178 |
| 1 | 60 | 35/6 | 1 | 4 | 1.75 | | 276 |
| 2 | 75 | 43/6 | 17/6 | 5 | 3.50 | | 316 |

MORSE DRILLS AND SOCKETS

No. 102% MORSE TAPER SHANK FITTING ANDREW'S SOCKETS



Fig. 663A

The above illustration represents the shank of the drill used in the Andrew's Socket The drills are held in place by the key in the socket. As the groove extends the entire length of the shank, there is no difficulty in placing the shank in the proper position.

The groove in the shank is deeper near the shoulder than at the outer end of the shank which prevents the drill from being pulled out of the socket as well as from turning in it.

Drills having shanks milled or fitted in this way are furnished at regular No. 102 list and discount.

No. 100 G, ANDREW'S PATENT DRILL SOCKETS FOR MORSE TAPER SHANK DRILLS



Fig. 663B

These sockets are fitted with a key sliding in a radial slot in the holding head. The key bears upon the inclined seat in the shank of the drill and is forced to its seat by a cap fitting over the holding head. Turning the cap by the hand in one direction holds the drill firmly in place while turning it in the opposite direction releases its grip so that the drill can be easily removed.

| Number | 1 | 2 | 3 | 4 | 5 |
|--|---|--------------|---------------------|-----------|-----------|
| Holds Drills (inclusive)inches Length Over All" | 14 to 18 7 | % to 33 | # to 11/4 10 | 11 to 2 | 21 to 3 |
| Diameter Blank End " Length " " " | $egin{array}{c} 1_{\stackrel{1}{1}\stackrel{6}{6}} \ 4 \end{array}$ | 11/4 41/4 | $\frac{11/2}{53/8}$ | 2 63⁄g | 25/8 9 |
| Priceeach | 5.00 | 6.50 | 9.00 | 12.00 | 15.00 |

No. 100 H, ANDREW'S PATENT DRILL SOCKETS FOR MORSE TAPER SHANK DRILLS



Fig. 663C

| Number | 1 | 1 | 2 | 2 | 3 | 4 | 5 |
|-------------------------------|------|------|------|------|------|-------|-------|
| Shank Fitted to Socket number | 2 | 3 | 3 | 4 | 4 | 5 | 6 |
| Priceeach | 5.80 | 5.80 | 7.20 | 8.60 | 9.70 | 12.80 | 19.50 |

MORSE TWIST DRILLS

DRILLS WITH SHANKS AS PER LIST No. 110 WILL FIT DRILL PRESSES OF

| CHAMPION BLOWER & FORGE Co., Lancaster, PaAll sizes if ordered |
|--|
| D. H. Potts, Lancaster, Pa |
| BOYNTON & PLUMMER, Worcester, Mass |
| BUDA FOUNDRY & Mrg. Co., Harvey, Ill |
| CANEDY-OTTO Mfg. Co. Chicago Heights, Ill. |
| Asa Goddard, Worcester, Mass |
| Illinois Iron & Bolt Co., Carpentersville, Ill Bailey No. 5 and Illinois Upright |
| B. B. Noyes & Co., Greenfield, Mass |
| Francis Reed Co., Worcester, Mass Nos. 3, 6, 7, 12, 14, 19 |
| Silver Mfg. Co., Salem, Obio |
| WILEY & RUSSELL Mrg. Co., Greenfield, Mass |
| Willer & Decision life, co., circulated, mass |
| · . |
| |
| DRILLS WITH SHANKS AS PER LISTS Nos. 111 AND 112 WILL FIT |
| DRILLS WITH SHANKS AS PER LISTS Nos. 111 AND 112 WILL FIT DRILL PRESSES OF |
| |
| DRILL PRESSES OF |
| M. L. Edwards Co., Salem, O |
| M. L. Edwards Co., Salem, O |
| M. L. Edwards Co., Salem, O. All sizes BOYNTON & PLUMMER, Worcester, Mass. All sizes except Nos. 14, 15, 16 BUFFALO FORGE Co., Buffalo, N. Y. All sizes CANEDY-Otto Mrg. Co., Chicago Heights, Ill. |
| DRILL PRESSES OF M. L. Edwards Co., Salem, O. All sizes Boynton & Plummer, Worcester, Mass. All sizes except Nos. 14, 15, 16 Buffalo Forge Co., Buffalo, N. Y. All sizes Canedy-Otto Mfg. Co., Chicago Heights, Ill. Champion Blower & Forge Co., Lancaster, Pa. All sizes |
| M. L. EDWARDS CO., Salem, O |
| DRILL PRESSES OF M. L. Edwards Co., Salem, O. All sizes Boynton & Plummer, Worcester, Mass. All sizes except Nos. 14, 15, 16 Buffalo Forge Co., Buffalo, N. Y. All sizes Canedy-Otto Mfg. Co., Chicago Heights, Ill. Champion Blower & Forge Co., Lancaster, Pa. All sizes |
| M. L. Edwards Co., Salem, O |
| M. L. Edwards Co., Salem, O. All sizes BOYNTON & PLUMMER, Worcester, Mass. All sizes except Nos. 14, 15, 16 BUFFALO FORGE Co., Buffalo, N. Y. All sizes CANEDY-OTTO MFG. Co., Chicago Heights, Ill. CHAMPION BLOWER & FORGE Co., Lancaster, Pa. All sizes B. B. Noyes & Co., Greenfield, Mass. Nos. 2, 4, 5, 6, 12 14, 16, 18, D-5 ASA GODDARD, Worcester, Mass. Nos. 2, 4 ILLINOIS Iron & BOLT Co., Carpentersville, Ill. Bailey Nos 2, 3, 4 and 1 Handy D. H. Potts, Lancaster, Pa. All sizes |
| M. L. Edwards Co., Salem, O. All sizes BOYNTON & PLUMMER, Worcester, Mass. All sizes except Nos. 14, 15, 16 BUFFALO FORGE Co., Buffalo, N. Y. All sizes CANEDY-OTTO MFG. Co., Chicago Heights, Ill. CHAMPION BLOWER & FORGE Co., Lancaster, Pa. All sizes B. B. Noyes & Co., Greenfield, Mass. Nos. 2, 4, 5, 6, 12 14, 16, 18, D-5 ASA GODDARD, Worcester, Mass. Nos. 2, 4 ILLINOIS Iron & BOLT Co., Carpentersville, Ill. Bailey Nos 2, 3, 4 and 1 Handy D. H. Potts, Lancaster, Pa. All sizes FRANCIS REED Co., Worcester, Mass. Nos. 0, 1, 1½, 2, 5, 8, 9, 11, 13, 18 |
| M. L. Edwards Co., Salem, O |
| M. L. Edwards Co., Salem, O. All sizes BOYNTON & PLUMMER, Worcester, Mass. All sizes except Nos. 14, 15, 16 BUFFALO FORGE Co., Buffalo, N. Y. All sizes CANEDY-OTTO MFG. Co., Chicago Heights, Ill. CHAMPION BLOWER & FORGE Co., Lancaster, Pa. All sizes B. B. Noyes & Co., Greenfield, Mass. Nos. 2, 4, 5, 6, 12 14, 16, 18, D-5 ASA GODDARD, Worcester, Mass. Nos. 2, 4 ILLINOIS Iron & BOLT Co., Carpentersville, Ill. Bailey Nos 2, 3, 4 and 1 Handy D. H. Potts, Lancaster, Pa. All sizes FRANCIS REED Co., Worcester, Mass. Nos. 0, 1, 1½, 2, 5, 8, 9, 11, 13, 18 |

No. 102 DRILLS WITH MORSE TAPER SHANKS WILL FIT DRILL PRESSES OF

AURORA TOOL WORKS, AURORA, Ill.
W. F. & JOHN BARNES Co., Rockford, Ill.
BICKFORD DRILL Co., Cincinnati, Ohio
CINCINNATI MACHINE TOOL Co., Cincinnati, O.
HENDEY MACHINE Co., Torrington. Conn.
NEW HAVEN MFG. Co., New Haven, Conn.
NILES TOOL WORKS, Hamilton, Ohio.
POND MACHINE TOOL Co., Plainfield, N. J.
PUTNAM MACHINE Co., Fitchburg, Mass.
PRENTICE BROS., Worcester, Mass.
SIGOURNEY TOOL Co., Hartford, Conn.

Note.—In ordering drills for above, specify manufacturer and size of press.

MORSE STRAIGHT SHANK WIRE DRILLS

No. 107



Fig. 420A

| No. by Gauge | Decimal Equiva- lent | Price per Dozen | Price Each | Approx. Length Inches | Twist Cut Inches | No. by Gauge | Decimal Equiva- lent | Price per Dozen | Price Each | Apprex. Length Inches | Twist Cut Inches |
|--------------------|----------------------------|-----------------------|---------------|---------------------------------|---|--------------------|----------------------------|-----------------------|---------------|---|--|
| 1 | .2280 | 2.35 | .22 | 4 | $2\frac{21}{32}$ | 41 | .0960 | 1.10 | .10 | 25/6 | 15/16 |
| 2 3 | .2210 | 2.35 | .22 | 315/6 | 25 8 | 42 | .0935 | 1.10 | .10 | 25 6 | 114 |
| 3 | . 2130 | 2.35 | .22 | 3136 | 25. | 43 | .0890 | 1.10 | .10 | 214 | 1_{372} |
| 4 | .2090 | 2.35 | .22 | 37/6 | $2\tfrac{19}{32}$ | 44 | .0860 | 1.10 | .10 | 236 | $\frac{1}{3}\frac{7}{2}$ $\frac{1}{3}\frac{7}{16}$ |
| 5 | .2055 | 2.35 | .22 | 313. | 29/16 | 45 | .0820 | 1.10 | .10 | 286 | 115 |
| 6 | .2040 | 2.25 | .21 | 31310 | 244 | 46 | .0810 | .95 | .09 | 2^{1}_{8} | 114 |
| 7 | .2010 | 2.25 | .21 | $3^{3}4$ | $2i_2$ | 47 | .0785 | . 95 | .09 | 216 216 | $\frac{1}{1}\frac{3}{16}$ |
| 8 | .1990 | 2.25 | .21 | 311 | $2\frac{15}{32}$ | 48 | .0760 | .95 | .09 | 2^{1}_{16} | 11/6 |
| 9 | .1960 | 2.25 | .21 | 306 | $2\frac{7}{16}$ | 49 | .0730 | .95 | .09 | 2 | 1 |
| 10 | .1935 | 2.25 | .21 | 308 | 23 8 | 50 | .0700 | .95 | .09 | 115/6 | 76 |
| 11 | .1910 | 2.10 | .20 | 3916 | 211 | 51 | .0670 | .95 | .09 | 145 178 | 15 |
| 12 | .1890 | 2.10 | .20 | 3916 | 25/6 | 52 | .0635 | .95 | .09 | 178 | |
| 13 | .1850 | 2.10 | .20 | 31/2 | $2\frac{16}{32}$ | 53 | .0595 | .95 | .09 | 1136 | ・ tenstal in tenstal III にっこう こう つっちゅうしゅう |
| 14 | .1820 | 2.10 | .20 | 3716 | $\begin{array}{c}21_4\\2_{32}^7\end{array}$ | 54 | .0550 | .95 | .09 | 1136 | 32 |
| 15 | .1800 | 2.10 | .20 | 3716 | $\frac{27}{332}$ | 55 | .0520 | .95 | .09 | $13\frac{1}{4}$ | 136 |
| 16 | .1770 | 1.95 | .19 | 33 8 | 23/16 | 56 | .0465 | .95 | .09 | 1116 | 53 |
| 17 | .1730 | 1.95 | .19 | 3516 | 2 5 | 57 | .0430 | .95 | .09 | 1116 | 57 |
| 18 | .1695 | 1.95 | .19 | 35/16 | Z 2 8 | 58 | .0420 | .95 | .09 | 15.8 | 52 |
| 19 | .1660 | 1.95 | .19 | 314 | $2\frac{3}{32}$ | 59 CO | .0410 | .95 | .09 | 196 | 16 |
| 20 | .1610 | 1.95 | .19 .17 | $\frac{3^{3}}{2^{3}}$ 16 | 21/6 | 60 | .0400 .0390 | .95 | .09 | 196 | 16 |
| 21 | .1590 .1570 | $1.75 \\ 1.75$ | .17 | $\frac{3_{16}^{2}}{3_{14}^{2}}$ | $2^{\frac{1}{16}}$ | $61 \\ 62$ | .0380 | .90 | .08 .08 | 112 | 28 |
| 22 | .1540 | $1.75 \\ 1.75$ | .17 | oá." | 2 | 63 | .0370 | .90 .90 | .08 | 112 | 28 |
| 23 | .1540 | $1.75 \\ 1.75$ | .17 | 3^{1}_{16} | $1\frac{31}{32}$ | 64 | .0360 | .90 | .08 | 112 | 2.8 |
| 24 | .1320 $.1495$ | $1.75 \\ 1.75$ | 17 | 3 16 | $1^{15}_{-16} + 1^{-15}_{-16}$ | | .0350 | .90 | .08 | 112 | 3.8 |
| 25 26 | .1430 | $\frac{1.45}{1.55}$ | .15 | $\frac{3}{2^{15}}$ | 1 32 | 66 | .0330 | .90 | .08 | 11/2 | 38 |
| 26 27 | .1440 | 1.55 | .15 | 915 | $\left[egin{array}{c} 1^7_{-8} \ 1^{27}_{42} \end{array} ight]$ | 67 | .0320 | .90 | .08 | 117 | |
| 28 | .1405 | 1.55 | 15 | $\frac{2^{15}}{2^{7}}$ | $1^{\frac{1}{12}}_{16}$ | 68 | .0310 | .90 | .08 | 176 | 1 16 |
| 29 | .1360 | $\frac{1.55}{1.55}$ | .15 | 019 | 134 | $^{\perp}$ 69 | .0292 | .90 | .08 | 13.5 | j 16 |
| 30 | .1285 | 1.55 | .15 | $2^{\mathrm{li}_{16}}$ | $\begin{bmatrix} -134 \\ 143 \end{bmatrix}$ | 70 | .0280 | .90 | .08 | $\frac{13\frac{3}{8}}{15\frac{16}{16}}$ | ે 16 |
| 31 | .1200 | 1.40 | .14 | $2^{3}4$ | $1^{\frac{132}{10}}_{16}$ | 71 | .0260 | 1.00 | .09 | 1516 | 16 1.⊲ |
| 32 | .1160 | 1.40 | .14 | $2^{rac{7}{16}}$ | 15 8 | 72 | .0250 | 1.00 | .09 | | 1.5 76 |
| 33 | .1130 | 1.40 | .14 | $2n_{16}^{16}$ | 15 8 | 73 | .0240 | 1.00 | .09 | 1316 | ु16 3 - |
| 34 | .1110 | 1.40 | .14 | $\frac{25}{8}$ | 160 | 74 | .0225 | 1.00 | .09 | 118 | 5_ |
| 35 | .1100 | 1.40 | .14 | 610/ | $\frac{1}{11/2}$ | 75 | ,0210 | 1.00 | .09 | 116 | 3.5.16.14.24.73.73.26.26.26.25.26.26.26.26.26.26.26.26.26.26.26.26.26. |
| 36 | .1065 | 1.25 | .12 | $2^{2}_{16} = 2^{9}_{16}$ | $ 11\frac{1}{2}$ | 76 | .0200 | 1.00 | .09 | 1 16 | 1.7 |
| 37 | .1040 | 1.25 | .12 | 2^{16} | 176 | 1 7 7 | .0180 | 1.00 | .09 | | 3 |
| 38 | .1015 | 1.25 | .12 | $\frac{272}{216}$ | 13.8 | 78 | ,0160 | 1.00 | .09 | 7% | 32 .L |
| 39 | .0995 | 1.25 | .12 | $\frac{2716}{2716}$ | 133 | 79 | .0145 | 1.00 | .09 | 13/6 7/8 13/6 | 32 |
| 40 | .0980 | 1.25 | .12 | 2^{16} | $1\frac{1}{3}\frac{32}{2}$ | 80 | 0135 | 1.00 | .09 | 34 | \$2° |

MORSE TAPER LENGTH DRILLS

FITTING THE PRENTICE BLACKSMITH'S DRILL PRESSES, Nos. 1 AND 2

No. 111 STYLE No. 1, SHANK 1/2 INCH DIAMETER, 21/2 INCHES LONG



Fig. 6275A

No. 111 STYLE No. 2. SHANK ¼ INCH DIAMETER, 2½ INCHES LONG



Fig. 6275B

| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Cut Inches |
|---|---------------|------------------------------|-------------------------------|----------------------------------|---------------------|---------------------------------------|---------------|
| 1/8 | .45 | 51/8 | 23/16 | 45 64 | 1.70 | 91/2 | 61/4 |
| 9 64 | .45 | 51/4 | 25/16 | 23 32 47 64 | 1.70 | 91/2 | 614 |
| 5 | .45 | 53/8 | 27/16 | 47 | 1.85 | 93/4 | 61/2 |
| 11 | .50 | 51/2 | 29/6 | 3/4 | 1.85 | 93/4 | 61/2 |
| 3/2 | .50 | 53/ | 213/16 | 49 | 2.00 | 97% | 65/8 |
| 13 | . 55 | 57% | 27/8 | 25 32 | 2.00 | 97/8 | 65/8 |
| 7 | .55 | 6 | 3 | 51 | 2.15 | 10 | 63/4 |
| 1/8 9-4 5-5 3-1-1 6-4 1-3-1 6-7 1-3-1 6-4 | .60 | 61/8 | 3 | 13/16 | 2.15 | 10 | 63/4 |
| 1/4 | .60 | 61/8 | 3 | 53 | 2.30 | 101/4 | 7 |
| 17 | .65 | 61/4 | 3 | 27 | 2.30 | 1014 | 7 |
| 9 | .65 | 614 | 3 | 27 32 55 64 | 2.45 | 101/2 | 71/4 |
| 19 | .70 | 63/8 | 31/8 | 7% | 2.45 | 101/2 | 71/ |
| 1/4 177 64 322 164 5/6 214 132 | .70 | 63% | 31/8 | 7/8 57 64 | 2.60 | 105% | 73% |
| 21 | .75 | 61/2 | 31, | 29 | 2.60 | 105% | 73% |
| 11 | .75 | 61/6 | 314 | 59 64 | $\frac{2.75}{2.75}$ | 103/4 | 71% |
| 32 | .80 | 63/4 | 31/2 | 15/16 | 2.75 | 103/4 | 716 |
| 84 | .80 | 63/4 | 31/2 | 61 61 64 | 2.90 | 107/8 | 75% |
| 25 | .85 | 7 | 33/4 | 64 | 2.90 | 107/8 | 75% |
| 64 | .85 | 7 | $3\frac{3}{4}$ | $\frac{31}{32}$ $\frac{63}{64}$ | 3.00 | 11 | 73 |
| 32 | .90 | 71/ | 4 | 1 64 | 3.00 | 11 | 73/2 |
| 64 | .90 | 71/1 | 4 | $1_{\frac{1}{32}}$ | 3.20 | 111/6 | 712 |
| 132 327 644 7/16 294 132 314 | .95 | 71/6 | 41/4 | 11/16 | 3.40 | 111/4 | 754 |
| 64 | .95 | 71/2 | 41/4 | $1\frac{1}{3}$ | 3.60 | 111/2 | 77/8 |
| 32 | 1.00 | 73/ | 41/2 | $1\frac{1}{8}$ | 3.80 | 1134 | 8 |
| 1/ | 1.00 | 73/ | 41/2 | $1\frac{5}{32}$ | 4.00 | 117/8 | 81/8 |
| 72 | 1.10 | 8 | 43/4 | $1\frac{32}{16}$ | 4.20 | 12 | |
| 64 | 1.10 | 8 | 43/4 | 1 7 | 4.40 | 121/8 | 81/4 |
| 32 | 1.20 | 81/4 | 5 | $\frac{1\frac{7}{32}}{11}$ | 4.50 | 121/8 | 83/8 |
| 72334 334 172354 916 37 | 1.20 | 81/4 | 5 | $1\frac{1}{4}$ $1\frac{9}{32}$ | 4.65 | 121/2 | 85% |
| 37 | 1.30 | 81/ | 51/4 | 15/ | 4.80 | 121/2 | 85% |
| 64 | 1.30 | 81/2 | 514 | $\frac{15}{16}$ $1\frac{11}{32}$ | 5.00 | 121/2 | -/.0 |
| 32 39 64 | 1.40 | 83/4 | 51/2 | 132 | 5.20 | 121/2 | 85/8 81/2 |
| 64 | 1.40 | 83/1 | 51/2 | | 5.40 | $\frac{12\frac{1}{2}}{12\frac{1}{2}}$ | |
| /8 | 1.50 | 9 | 53/ | - 32 | 5.40 | | 81/2 |
| 64 | 1.50 | 9 | 14 | 17/16 | | 121/2 | 81/2 |
| 32 | 1.60 | | 5 ³ / ₄ | $\frac{1\frac{15}{32}}{11}$ | 5.80 | 121/2 | 81/2 |
| 43 64 11/10 | 1.60 | 914 | 0 | $1\frac{1}{2}$ | 6.00 | $12\frac{1}{2}$ | 83/8 |

Style No. 2 always furnished unless otherwise ordered.

MORSE TAPER SHANK TWIST DRILLS

No. 102 WITH INCREASE TWIST OR CONSTANT ANGLE



| Fig. (| 8305 A | |
|--------|--------|--|
|--------|--------|--|

| Diameter Inches Decimal Equivalent | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivalent | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivalent | Price Each | | Twist Cut Inches |
|--|--|--|--|--|---|---|---|--|---------------------------------------|--|--|---|---|
| 125 1406 1562 1406 1562 1406 1562 1406 1562 1 | .35 .40 .45 .45 .45 .50 .55 .55 .60 .65 .70 .75 .75 .80 .85 .90 .95 .95 1.00 1.10 | 41/2 8 8 4 4 1 8 2 2 4 4 4 5 1 5 5 5 5 5 5 5 6 6 6 6 6 6 6 6 6 6 6 | 113.32.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6.6 | 9.16149204-\8.44\1514-\604931-14\494971-1-\6048-7504-\8048-7504-\6048-7504\\90497-14\49497-14\6048-7504-\8048-804-\8048-7504-\8048-804-\8048-7504-\8048-7504-\8048-7504-\8048-7504-\8048-7504-\8048-804-\8048-750 | .5625 .5781 .5937 .6093 .625 .6406 .6562 .6718 .6875 .7031 .7187 .7343 .75 .7656 .7812 .7968 .8125 .8281 .8437 .8593 .875 .8906 .9062 .9218 .9375 .9531 .9687 .9843 1 | 1.20 1.30 1.40 1.40 1.50 1.50 1.60 1.60 1.70 1.70 1.70 2.15 2.20 2.25 2.30 2.45 2.45 2.26 2.275 2.290 2.290 2.290 2.30 2.30 2.30 2.30 2.30 2.30 2.30 2.3 | 8148128134814814991449154911014410142101014410178 | 1 16 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 1.0625 1.0781 1.0937 1.1093 1.125 1.1406 1.1562 1.1718 1.1875 1.2031 1.215 1.2343 1.25 1.2656 1.2812 1.3437 1.3591 1.3437 1.3591 1.3437 1.3591 1.3462 1.4218 1.4531 1.4531 1.4531 1.4531 1.4531 1.5156 | 3.40 3.60 3.80 3.80 4.00 4.20 4.40 4.40 4.50 4.50 4.65 4.65 4.80 5.00 5.20 | 1114 1114 11134 11134 11134 11178 11218 11218 11218 11218 11218 11418 11 | - 666677777777777778888888899999999999999 |

ABOVE DRILLS HAVE TAPER SHANK AS FOLLOWS

| Diameters (inclusive) | .inches | 1 ₁₆ to 9 | 3 | { to 38 | §9 to 114 | 117 to 111 |
|-----------------------|---------|----------------------|---|---------|-----------|------------|
| Morse Taper Shank | number | 1 | | 9 | 2 | 4 |
| Morse Taper Shank | number | | | 4 | 1 ., | 1 192 |

MORSE TAPER SHANK TWIST DRILLS

No. 102

WITH INCREASE TWIST OR CONSTANT ANGLE



Fig. 6304A

| Di ameter Inches | Decimal Equivalent | Price Each | Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivalent | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivalent | Price Each | Length Over All Inches | Twist Cut Inches |
|--|-----------------------|----------------------|--|--|---------------------------------------|-----------------------|----------------|---------------------------------|---|--|-----------------------|----------------|---|---------------------------|
| | 1.5625 | 6.60 | 151/4 | 95 8 95 8 95 8 97 8 97 8 97 8 97 8 101 8 101 8 | | 2.0468 | 10.60 | 17 | 10 | 217 2354 2964 2964 2334 2334 258 258 | 2.5312 | 15.90 | 19½ 19¼ | |
| 137 | 1.5781 | 6.90 | 151/4 | 958 | 216 | 2.0625 | 10.60 | 17 | 10 | 234 | 2.5468 | 16.20 | 1914 | 115/8 |
| 1 1 1 | 1.5937 | 6.90 | 151/4 | 95/8 | 25 | 2.0781 | 10.90 | 17 | 10 | 2% | 2.5625 | 16.20 | 191/4 | 11^{5} |
| 133 | 1.6093 | 7.20 | $15\frac{1}{2}$ $15\frac{1}{2}$ | 978 | $2\frac{3}{32}$ | 2.0937 | 10.90 | 17 | 10 | 237 | 2.5781 | 16.50 | 1914 1912 1912 1912 | $\frac{1178}{1178}$ |
| 15% | 1.625 | 7.20 | $15\frac{1}{2}$ | $9\frac{7}{8}$ | 254 | 2.1093 | 11.20 | 17 | 10 | 232 | 2.5937 | 16.50 | 191/2 | |
| 141 | 1.6406 | 7.50 | 151/6 | 97/8 | 21/8 | 2.125 | 11.20 | 17 | 10 | 287 | 2.6093 | 16.80 | 191/2 | 1178 |
| $1\frac{31}{32}$ | 1.6562 | 7.50 | $15\frac{1}{2}$ | 91/8 | 264 | 2.1406 | 11.60 | 17 | 10 | 25/8 | 2.625 | 16.80 | 1946 | 1134 |
| 143 | 1.6718 | 7.80 | 1534 1534 1534 | 101/8 | 237 | 2.1562 | 11.60 | 17 | 10 | 211 211 211 211 211 211 211 211 211 211 | 2.6406 | 17.20 | 20 | 1214 |
| 11/16 | 1.6875 | 7.80 | 1534 | 101/8 | 244 | 2.1718 | 12.00 | 17 17 | 10 10 | 233 | 2.6562 | 17.20 | 20 | 1214 |
| 144 | 1.7031 | 8.10 | 1534 | 101/8 | 2%6 | 2.1875 | 12.00 | 1717 | 101 | 284 | 2.6718 | 17.60 | 20 20 | 1214 |
| 133 | 1.7187 | 8,10 | 153/4 | 9"16 | 267 | 2.2031 | 12.40 | 1712 | 101/2 101/2 101/2 101/8 101/8 101/8 101/8 | 2.76 | 2.6875 2.7031 | 17.60 18.30 | 20 | 1214 |
| 147 | 1.7343 | | 16 | 915)6 915)6 | 015 | 2.2187 2.2343 | 12.40 12.80 | 1712 | 101/2 | 923 | 2.7187 | 18.30 | 201/2 | 12^{3}_{4} 12^{3}_{4} |
| 18/4 | 1.75 | 8.40 | 16 | 012 | 583 | 2.25 | 12.80 | 1712 | 1012 | 237 | 2.7343 | 19.00 | $20\frac{1}{2}$ $20\frac{1}{2}$ $20\frac{1}{2}$ | 1234 |
| 184 | 1.7656 | | 16 16 | 015 | 217 | 2.2656 | 13.20 | 1712 | 1012 | 234 | 2.75 | 19.00 | 20,2 | 125 |
| 1 1 1 1 | 1.7812 | 8.80 | 161/4 | 103/ | 254 | 2.2812 | 13.20 | 171 | 1018 | 244 | 2.75 2.7656 | 19.50 | $20\frac{1}{2}$ | 125 |
| 184 | 1.7968 1.8125 | 8.80 | 1614 | 1012 | 533 | 2.2968 | 13.20 13.60 | 1712 | 101% | 235 | 2.7812 | 19.50 | 2012 | 125 |
| 1576 | 1.8281 | 9.00 | 1614 | 1012 | 252 | 2.3125 | 13.60 | 171% | 1013 | 235 231 | 2.7968 | 20.00 | 2012 | 125 |
| 187 | 1.8437 | 9.00 | 1614 | 9 ¹⁵ / ₆ 9 ¹⁵ / ₆ 10 ³ / ₆ 10 ¹ / ₈ 10 ³ / ₈ | $\frac{2\frac{5}{6}}{2\frac{21}{64}}$ | 2.3281 | 14.00 | 18 | 1053 | 2136 | 2.7968 2.8125 | 20.00 | | 125 |
| 155 | 1.8593 | 9.20 | 161/2 | 103 | 211 | 2.3437 | 14.00 | 18 | 105 8 105 8 | 283 | 2.8281 | 20.50 | 21 | 131 |
| 177 | 1.875 | 9 20 | 161/2 | 10 ³ 8 | $2\frac{11}{28}$ | 2.3593 | 14.40 | 18 | 105/8 | 277 | 2.8281 2.8437 | 20.50 | 21 | 131 |
| 157 | 1.8906 | 9.20 9.35 9.35 | 1616 | 103 8 | 23% | 2.375 | 14.40 | 18 | 101/61 | 255 27/8 257 257 | 2.8593 2.875 | 21.00 | 21 | 131 |
| 1 22 | 1.9062 | 9.35 | 1616 | 103 | 274 | 2.3906 | 14,70 | 18½ 18½ 18½ 18½ 18½ | 11 | 27% | 2.875 | 21.00 | | 13 |
| 1 2 2 | 1.9218 | 9.50 | 161% | 103 | 2 13 | 2.4062 | 14.70 | 181/2 | 11 | 257 | 2.8906 | 22.00 | | 13 |
| 14% | 1 9375 | 9.50 | 1613 | 101, | 227 | 2.4218 | 15.00 | 181/2 | 11 | 233 253 253 | 2.9062 | 22.00 | | 13 |
| 191 | 1.9531 | 9.65 | 161/2 | 101, | 276 | 2.4375 | 15.00 | $ 18\frac{1}{2}$ | 11 | 253 | 2.9218 | 23.00 | | 13 |
| ī | 1.9687 | 9.65 | $16\frac{1}{2}$ | 101 | 237 | 2.4531 | 15.30 | 19 | 111/2 | 25% | 2.9375 | 23.00 | | 13 14 |
| 11111111111111111111111111111111111111 | 1.9843 | 9.80 | 161/2 161/2 161/2 161/2 161/2 161/2 | 1014 | 1 243 | 2.4687 | 15.30 | 19 | 111/2 | $2\frac{2}{3}$ $2\frac{3}{3}$ | 2.9531 | 24.00 | | 14 |
| $	ilde{f 2}$ | 2 | 9.80 | $16\frac{1}{2}$ | 101 | 1 231 | 2.4843 | 15.60 | 19 | $\frac{111_{2}}{11_{3}}$ | $2\frac{31}{32}$ | 2.9687 | 24.00 | | 14 |
| 2 2 2 2 3 2 | 2.0156 | 10.20 | $16\frac{1}{2}$ | 91/2 | $2\frac{1}{2}$ | 2.5 | 15.60 | 19 | 1138 | 283 | 2.9843 | | | 14 |
| $2\frac{\gamma}{4}$ | 2.0312 | 10.20 | $16\frac{1}{2}$ | 91/2 | 1 233 | 2.5156 | 15.90 | 191/4 | $ 11\frac{5}{8} $ | 3 | 3 | 25.00 | 22 | 137 |

ABOVE DRILLS HAVE TAPER SHANK AS FOLLOWS

| Diameters (inclusive)inches | 1% to 2 | 2^{1}_{64} to 3 |
|-----------------------------|---------|---------------------|
| Morse Taper Shanknumber | 4 | 5 |

MORSE STRAIGHT SHANK TAPER LENGTH TWIST DRILLS

No. 104

WITH INCREASE TWIST OR CONSTANT ANGLE



Fig. 6306A

| | | | | | | | | _ | | | | | | |
|--|-----------------------|---------------------|--|--|----------------------|---|--|--|---|---|-----------------------|---------------------|------------------------------------|---|
| eter | Decimal Equivalent | | 된 | , s | eter | Decimal Equivalent | | S All | _ z | eter | Decimal Equivalent | | th Ball | 5 86 |
| Diameter Inches | Decir Equi | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivale | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivale | Price Each | Length Over Al Inches | Twist Cut Inches |
| 1/6 4 37 4 /8 9 4 5 2 1 4 /6 3 4 7 2 5 4 6 5 3 1 6 5 7 2 5 4 | .0625 | .35 | 3 334 | $\frac{1!_{4}}{13_{8}}$ | 9 16 37 64 | .5625 .5781 | $\frac{1.20}{1.30}$ | 81, | $\frac{53}{55} \frac{8}{8}$ | 11/16 | 1.0625 1.0781 | $\frac{1}{3.40}$ | 11!4 11! ₂ | 73 § 75 § |
| 64 | .0937 | .40 | $\frac{3)_{4}}{4!_{4}}$ | 15 5 | 64 32 | .5937 | 1.30 | 81/ ₂ 81/ ₂ 83/ ₄ | 55% | 1_{64}^{54} 1_{32}^{32} 1_{64}^{74} | 1.0937 | 3.60 | 111/6 | $75\frac{8}{8}$ |
| 64 | .1093 | .45 | 45 | 214 | 39 64 | .6093 | 1.40 | $83\frac{7}{4}$ | 53/ | 164 | 1.1093 | 3.80 | 1134 | $7\frac{7}{8}$ |
| 1/8 | .125 | .45 | $5\frac{1}{8}$ | $\frac{21}{2}$ | $\frac{5}{8}$ | .625 | $\frac{1.40}{1.50}$ | 834 | $\frac{53}{24}$ | 11/8 | 1.125 | 3.80 | 1134 | 7 ³8 |
| 64 | .1406 $.1562$ | .45 .45 | $\frac{5\hat{1}_{4}^{2}}{5\hat{2}_{8}}$ | $\frac{2^3_4}{3}$ | 41 64 21 | .6406 .6562 | 1.50 | 9 | 534 578 578 | 164 | $1.1406 \\ 1.1562$ | 4.00 4.00 | 117_{8} | 8 . |
| 32 | .1718 | .50 | $\begin{bmatrix} 51/2 \\ 53/4 \end{bmatrix}$ | 31. | 32 43 64 | .6718 | 1.60 | 914 | 6 8 | 11/8 164 152 111 | 1.1718 | $\frac{4.20}{4.20}$ | 12 | 81/8 |
| 376 | .1875 | .50 | $53\frac{2}{4}$ | $ \begin{array}{c c} 31_{4} \\ 31_{2} \\ 33_{4} \end{array} $ | 1116 | .6875 | 1.60 | 917 | 6 | 13/6 | 1.1718 1.1875 | 4.20 | 12 | 81_8 |
| 13 | .2031 | .55 | 57 s | 334^{+} | 69 | .7031 | 1.70 | $91\frac{7}{2}$ $91\frac{7}{2}$ | 63/16 | $1\frac{1}{6}$ | 1.2031 | 4.40 | $12\frac{1}{8}$ | 81_{8} |
| 32 | $.2187 \\ .2343$ | .55 | $\frac{6}{6^{1}}$ 8 | 4 | 23 32 47 | .7187 .7343 | $\begin{bmatrix} 1.70 \\ 1.85 \end{bmatrix}$ | 934 | | 1 1 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | $1.2187 \\ 1.2343$ | 4.40 4.50 | $12\frac{1}{8}$ $12\frac{1}{2}$ | 81/8 |
| 64 1 | .25 | .60 | 618 | 4 | $\frac{64}{34}$ | .75 | 1.85 | 93. | 63 8 | 161 | 1.25 | 4.50 | $12\frac{1}{2}$ | 81/2 |
| 1 14 | .2656 | .65 | 613 | 4 | 17 | .7656 | 2.00 | 97 8 | | 117 | 1.2656 | 4.65 | 1414 | $9r^8$ |
| 3 2 | .2812 | .65 | 61^{4} | 4 | 19 64 23 32 | .7812 | 2.00 | 97_8 | $\begin{array}{c} 61/2 \\ 61/2 \end{array}$ | 1 🖧 | 1.2812 | 4.65 | 141 | 91_{8} |
| 64 | .2968 | .70 | $\frac{63}{63}$ | 41 ₁₆ | 81 | .7968 | 2.15 | 10 | 65 8 | 1 1 5 | 1.2968 | 4.80 | 1414 | 914 |
| 216 | $.3125 \\ .3281$ | .70 .75 | $\frac{61}{2}$ | 4 16 | 13 16 53 | .8125 .8281 | $\frac{2.15}{2.30}$ | 10 101 | $\begin{array}{c} 65_8 \\ 63_4 \end{array}$ | $1\frac{5}{16}$ | 1.3125 1.3281 | $\frac{4.80}{5.00}$ | | $\begin{array}{c} 91_4 \\ 93_8 \end{array}$ |
| 64 11 | .3437 | 75 | 6^{1}_{2} | 418 | 64 55 | .8437 | $\frac{2.30}{2.30}$ | 101 | $6\frac{3}{4}$ | 111 | 1.3437 | 5 00 | 143 | 93 |
| 23 | .3593 | .80 | 63 | 411 | 64 55 54 8 | .8593 | [2.45] | 1012 | 7 | 133 | 1.3593 | 5.20 | 1412 | 914 |
| 3 8 | .375 | .80 | 63_{4} | 41, | 7.8 | .875 | 2.45 | 101/2 | 7 | $13 \stackrel{?}{\downarrow}$ | 1.375 | 5.20 | 141/2 | 91/2 |
| 61 61 | .3906 | .85 .85 | 7 | 43 | 574 629 32 | .8906 | 2.60 | 105 | 7 | 185 | 1.3906 1.4062 | 5 40 5 40 | 149 8 | 91 ₂ 91 ₃ |
| 32 | $.4062 \\ .4218$ | .90 | 714 | 45 | 59 | .9062 | $2.60 \\ 2.75$ | 10^{5} 10^{3} | $\begin{array}{c c}7\\7\end{array}$ | $\frac{1}{3}$ $\frac{1}{2}$ | 1.4062 1.4218 | 5.40 5.60 | $\frac{145}{143}$ | $\begin{array}{c} 9_{12} \\ 9_{23} \end{array}$ |
| 7/4 | .4375 | .90 | 714 | 45 | 6.4 15/2 16 | .9375 | $\frac{2}{2}.75$ | | 7 | 1 1% | 1.4375 | 5.60 | 143. | 95 3 |
| 84 | .4531 | .95 | $71\frac{7}{2}$ | 47 | 61 | .9531 | 2,90 | 1078 | 71/s | 189 133 131 | 1.4531 | 5.80 | 14% | 934 |
| 35 | .4687 | .95 | $\begin{array}{ c c c }\hline 71_2 \\ 71_2 \\ \hline 73_4 \\ \hline \end{array}$ | 47 s | 31 63 | .9687 | 2.90 | | -71_{8} | 1 13 | 1.4687 | 5.80 | | 934 |
| 81 | .4843 $.5$ | $\frac{1.00}{1.00}$ | $\frac{134}{734}$ | 5 5 | 1 64 | .9843 | $\begin{vmatrix} 3.00 \\ 3.00 \end{vmatrix}$ | | 73 ₁₆ | 117 | 1.4843 1.5 | 6.00 | | $978 \\ 97$ |
| 72 | .5 .5156 | 1.10 | 8 4 | 5.1 | 1_{64} | $egin{pmatrix} 1. \ 1.0156 \end{smallmatrix}$ | $\frac{3.00}{3.20}$ | | 73_{16} | 133 | 1.5156 | 6.30 | | 91/2 |
| 1 16 011-05 280 1326 13 126 17 18 16 17 18 18 18 18 18 18 18 18 18 18 18 18 18 | .5312 | 1.10 | 8 | 514 | 1_{32}^{64} | 1.0312 | 3.20 | | 75 16 | $1\frac{1}{3}$ | 1.5312 | 6.30 | 15 | 91_2 |
| 35 64 | .5468 | 1.20 | 81_4 | -5^{3} | 1.3 | 1.0468 | 3.40 | $\Pi \Pi_4^2$ | 73 s | $ \begin{array}{c} 11_{2} \\ 133 \\ 145 \\ 135 \\ 135 \end{array} $ | 1.5468 | 6.60 | 1514 | 934 |

Drills 1_{64}^{33} to 2 inches have shanks $1\frac{1}{2}$ inches diameter, $4\frac{3}{4}$ inches long.



MORSE STRAIGHT SHANK TAPER LENGTH TWIST DRILLS

No. 104

WITH INCREASE TWIST OR CONSTANT ANGLE



Fig. 6307A

| ==== | | | | | | | | | | | | | | |
|---|---|--|---|--|--|--|---|---|---|--|---|--|--|--|
| Diameter Inches | Decimal Equivalent | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivalent | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Decimal Equivalent | Price Each | Length Over All Inches | Twist Cut Inches |
| 11/2/21 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | .5625 .5781 .5937 .6093 .625 .6406 .6562 .6718 .6875 .7031 .7187 .7343 .75 .7656 .8125 .8281 .8437 .8437 | 6.60 6.90 6.90 7.20 7.50 7.50 7.80 8.10 8.40 8.60 8.60 8.80 9.00 9.20 | 1514 1514 1514 1514 1514 1514 1514 1534 153 | 93/4 93/4 10 10 10 10 10 10 10 10 10 10 10 10 10 | 22222222222222222222222222222222222222 | 2.0468 2.0625 2.0781 2.0938 2.1093 2.125 2.1406 2.1562 2.1718 2.2031 2.2187 2.2343 2.25656 2.2812 2.2968 2.3281 2.3281 2.3281 | 10.60 10.90 10.90 11.20 11.60 12.00 12.40 12.40 12.80 13.20 13.60 13.60 14.00 | 17 17 17 17 17 17 17 17 17 17 17 17 17 1 | 101/8 101/8 101/8 101/8 101/8 101/8 101/8 101/8 101/8 101/8 101/4 101/4 101/4 101/4 101/4 101/4 101/4 101/4 101/4 | 12164 (Entablish (Surface) (Edeptina (Asiantina (Edeptina (Asiantina (Edeptina (Asiantina (Edeptina (Edept | 2.5312 2.5468 2.5625 2.5781 2.5937 2.6938 2.625 2.6406 2.6562 2.6562 2.7187 2.7343 2.7187 2.7566 2.7656 2.7812 2.7812 2.7812 2.8125 2.8125 | 15.90 16.20 16.50 16.50 16.80 17.20 17.60 17.60 18.30 19.00 19.50 20.00 20.00 20.50 | 1914 1914 1914 1912 1912 1912 20 20 20 20 2012 2012 20 | 113/4 113/4 113/4 112 12 12 12 12/8 123/8 123/8 127/8 123/4 123/4 123/4 123/4 123/4 |
| $egin{array}{c c} 2 & 2 \ 2_{64} & 2 \end{array}$ | .875 .8906 .9062 .9218 .9375 .9531 .9687 .9843 | | 16½ 16½ 16½ 16½ 16½ 16½ 16½ 16½ 16½ | 11 11 11 11 11 11 11 95 s | 20220202020202020202020202020202020202 | 2,3593 2,375 2,3906 2,4062 2,4218 2,4375 2,4531 2,4687 2,4843 2,5 2,5156 | 14.40 14.70 14.70 15.00 15.30 15.30 15.60 15.60 | 18½ 18½ 18½ 18½ 19 19 19 | 1034 1058 1118 1118 1118 1158 1158 1158 1158 | 222224 222224 2222224 2222234 | 2.8437 2.8593 2.875 2.8906 2.9062 2.9218 2.9375 2.9531 2.9687 2.9843 | $21.00 \\ 22.00 \\ 22.00$ | 21 21 21 21 22 22 22 | 1314 1314 1318 1318 1318 1318 1418 1418 |

Drills $1\frac{33}{64}$ to 2 inches have shanks $1\frac{1}{2}$ inches diameter, $4\frac{3}{4}$ inches long. Drills $2\frac{3}{64}$ to 3 inches have shanks $1\frac{3}{4}$ inches diameter, 6 inches long.



MORSE TWIST DRILLS

FITTING COES' BLACKSMITHS' DRILL PRESS AND PRENTICE DRILL PRESS No. 3



Fig. 7408B

| | | | | TUOD | | | |
|---|---------------|---|-------------------------------|---|---------------------|------------------------------|--|
| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches |
| 1/8 | .55 | 47/8 | 23/16 | 43 | 1.30 | 6 | |
| 20. | .58 | 5´ ° | 25% 276 276 | 35 | 1.30 | 6 | |
| 35 | .58 | 51/8 | 27% | \$1 | 1.35 | 6 | 3 |
| ļļ. | .60 | $51\mathring{1}$ | 29^{16}_{16} | 13.4 | 1.35 | 6 | 3 |
| \$ <u>`</u> | .60 | 513 | $\overline{2}_{13}_{16}^{10}$ | 53 | 1.40 | 6 | ž |
| 13 | .65 | · 55 3 | $\frac{27}{8}^{16}$ | 67 27 | 1.40 | 6 | ğ |
| 64 | .65 | $\frac{5^{3} \frac{8}{4}}{5^{3} \frac{4}{4}}$ | 3 8 | 32 55 | 1.45 | 6 | 3 |
| 1/96 57-14/1674 7764 /47-14 97-14/1614 17734 /854 77-14/1694 071-14 | .70 | 57/8 | 3 | 64 | 1.45 | 6 | 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 |
| 87 1/ | .70 | 31/8 | | 2 8 | | 6 | 9 |
| 74 | | 6 | 3 3 | 64 | 1.55 | | o o |
| 8₫ | . 73 | 6 | 3 | 55 | 1.55 | 6 | 3 |
| 32 | . 73 | 6 | 3 | 81 | 1.60 | 6 | 3 |
| 67 | . 75 | 6 | 3 | 15/6 | 1.60 | 6 | 3 |
| 5/16 | . 75 | 6 | 3 3 3 | 81 | 1.70 | 6 | 3 |
| 21 | .80 | 6 | 3 | 31 | 1.70 | 6 | 3 |
| $\frac{11}{32}$ | .80 | 6 | 3 | 83 | 1.80 | 6 | 3 |
| 43 | .85 | 6 | 3 | 1 | 1.80 | 6 | 3 3 3 |
| 3/8 | .85 | 6 | 3 | 1 분 | 1.90 | 6 | 3 |
| 25 | .88 | 6 | 3 | $\frac{1}{1}\frac{1}{32}$ $\frac{1}{16}$ | 2.00 | 6 | 3 |
| ii | .88 | 6 | $\tilde{3}$ | $\tilde{1}_{\frac{3}{32}}^{\frac{10}{2}}$ | 2.10 | 6 | š |
| 37 | .90 | Ğ | ă | 1_{18}^{32} | $\frac{2.20}{2.20}$ | ě ' | 3 3 5 5 5 5 5 |
| 7/ | .90 | Ğ | $ \frac{3}{3}$ | $1\frac{5}{32}$ | 2.25 | 6 | ğ |
| ∕16 29 | .93 | 6 | 3 | | $\frac{2.20}{2.30}$ | 6 | ä |
| 64 15 | .93 | 6 | 3 | Io | $\frac{2.30}{2.35}$ | 6 | 9 |
| 37 | . 95 . 95 | 6 | | $\frac{1}{3}\frac{7}{2}$ | | 6 | 9 |
| 81 | | | 3 | 114 | 2.40 | | o o |
| ₹2 | .95 | 6 | 3 | $1\frac{9}{32}$ | 2.50 | 6 | 3 |
| 67 | .98 | 6 | 3 | 156 | 2.60 | 6 | 3 |
| $\frac{1}{3}\frac{7}{2}$ | .98 | 6 | 3 | 1 1 1 1 | 2.70 | 6 | 3 |
| 83 | 1.00 | 6 | 3 | 13/8 | 2.80 | 6 | 3 |
| 1/2334 3647 3754/674 9/374 19294 | 1.00 | 6 | 3 | 1 13 | 2.90 | 6 | 3 3 3 |
| 37 | 1.03 | 6 | 3 | 176 | 3.00 | 6 | 3 |
| $\frac{19}{32}$ | 1.03 | 6 | 3 | 1 13 | 3.10 | 6 | 3 3 3 |
| 39 | 1.05 | 6 | 3 | 11/2 | 3.20 | 6 | 3 |
| 5 2 | 1.05 | 6 | 3 | 1_{16}^{9} | 3.40 | 6 | 3 |
| žΫ | 1.10 | 6 | 3 | 15% | 3.60 | 6 | 3 |
| 21 | 1.10 | 6 | š | 111 | 3.80 | 6 | 3 |
| 32 43 64 | 1.15 | Ğ | ä | $1\frac{1}{3}\frac{16}{4}$ | 4.05 | 6 | š |
| 64 117 / 16 | 1.15 | Ğ | $\ddot{3}$ | 113 | 4.30 | 6 | 3 3 3 3 3 3 3 3 3 3 |
| 16 45 | 1.10 | 6 | 3 | $176 \atop 178$ | 4.50 | 6 | 9 9 |
| 64 23 | 1.20 | ő | 3 | 1157 | 4.75 | 6 | 9 |
| 3.2 4.7 | | | | 115/2 | | 6 | 3 3 |
| 64 | 1.25 | 6 | 3 | 2 | 5.00 | v | 3 |
| 3⁄4 | 1,25 | 6 | 3 | | • • • • _ | •• | |

Shanks .647-inch exact diameter (about \$\frac{1}{4}\$-inch) and \$2^{1}_{4}\$ inches long. Style No. 2 always furnished unless otherwise ordered.

MORSE STRAIGHT SHANK DRILLS

WITH INCREASE TWIST OR CONSTANT ANGLE

No. 105 JOBBERS' AND MACHINISTS' SETS



Fig. 430A

No. 106 LETTER SIZES



Fig. 430B

No. 105

| Diam. Inches | Decimal Equiva- lent | Price per Dozen | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Inches | Decimal Equiva- lent | Price per Dozen | Price Each | Length Over All Inches | Twist Cut Inches |
|---|----------------------------|-----------------------|---------------|------------------------------|------------------------------|-----------------|----------------------------|-----------------------|---------------|------------------------------|------------------------|
| 32 | .0312 | .90 | .09 | 17/16 | 9/16 | 32 | .2812 | 3.65 | .32 | 414 | 231 |
| 8 ³ 4 | .0468 | 1.00 | .09 | 111/16 | 35 | 19 | .2968 | 3.90 | .35 | 43 % | 33 |
| 33 64 1/16 | .0625 | 1.00 | .09 | 21/2 | 114 | 5/6 | .3125 | 4.20 | .37 | 41/2 | 33% |
| 64 | .0781 | 1.10 | . 10 | 25 8 | 13 % | 81 | .3281 | 4.50 | .40 | 45% | 35/6 |
| 37 | .0937 | 1.20 | .11 | 23/4 | 11/2 | 3 2 | .3437 | 4.80 | .42 | 424 | 343 |
| 67 | .1093 | 1.30 | . 12 | 27/8 | 111/6 | 64 | .3593 | 5.10 | . 45 | 478 | 3 3 3 2 |
| 64 37 64 /8 94 65 74 65 72 54 65 72 54 65 72 54 | .125 | 1.45 | . 13 | 3 | 113/6 | 3 8 | .375 | 5.40 | .48 | 5 | 35% |
| 9 6.4 | .1406 | 1.60 | . 15 | $3\iota_{8}$ | 115 | 61 | .3906 | 5.70 | .50 | 518 | 334 |
| 32 | . 1562 | 1.80 | . 16 | 314 | 2.3, | 13 37 64 | . 4062 | 6.00 | .53 | 514 | 334 |
| ĬĪ | .1718 | 2.00 | .18 | 33 3 | 2.7 | 27 61 | .4218 | 6.40 | .55 | 53 8 | 3 3 3 3 |
| 3/6 | .1875 | 2.20 | .20 | 31/2 | 256 | 7/6 | . 4375 | 6.80 | .59 | 51/2 | 41/6 |
| 17 | . 2031 | 2.40 | . 21 | $3^{5}\overline{8}$ | $2\frac{76}{2\frac{12}{32}}$ | 716 29 64 | . 4531 | 7.20 | .63 | 5^{5} | 43/6 |
| 32 | .2187 | 2.65 | .23 | $33\overset{\circ}{4}$ | $2\frac{1}{32}$ | $\frac{15}{32}$ | .4687 | 7.50 | .65 | $53\frac{3}{4}$ | $4\frac{9}{32}$ |
| ĬĬ. | .2343 | 2.90 | .26 | 378 | 231 | 31 64 | .4843 | 7.75 | .67 | $5\frac{7}{8}$ | $4\frac{13}{32}$ |
| 14 | .25 | 3.15 | .28 | 4 | $2^{3}\overline{4}$ | 1/2 | .5 | 8.00 | .70 | 6 | 41/2 |
| 17 | .2656 | 3.40 | .30 | 41/8 | 27, | | | ١ | | | |

No. 106

| Size | Decimal Equiva- lent | Price per Dozen | Price Each | Length Over All Inches | Twist Cut Inches | Size | Decimal Equiva- lent | Price per Dozen | Price Each | Length Over All Inches | Twist Cut Inches |
|--------------|----------------------------|-----------------------|---------------|------------------------------|--------------------------------|--------------|----------------------------|-----------------------|---------------|------------------------------|------------------------|
| A | .234 | 2.90 | . 26 | 313/16 | $2\frac{19}{32}$ | N | .302 | 4.20 | .37 | 41/4 | 231 |
| В | .238 | 3.00 | .27 | 313 ¹⁷ | 213 | O | .316 | 4.30 | .38 | 41/4 | $2\frac{5}{6}$ |
| С | .242 | 3.10 | .28 | 3137 | 2 3 2 | \mathbf{P} | .323 | 4.40 | .39 | 41/2 | 3 3 |
| D | .246 | 3.20 | .29 | 313,6 | $2\tfrac{15}{32}$ | Q | .332 | 4.60 | .40 | 45% | 35/16 |
| \mathbf{E} | .250 | 3.30 | .30 | 31316 | 2 16 | Ř | .339 | 4.80 | .42 | 45/8 | 3.5 |
| F | .257 | 3.40 | .30 | 41, | 3. | \mathbf{s} | .348 | 5.00 | .44 | 434 | 313 |
| \mathbf{G} | .261 | 3.50 | .31 | 41_4 | 3 | \mathbf{T} | .358 | 5.20 | .45 | 43/4 | 3 👯 |
| H | .266 | 3.60 | .32 | 414 | 1 3 | U | .368 | 5.40 | .47 | 478 | 337 |
| I | .272 | 3.70 | .33 | 411 | 3 | V | .377 | 5.60 | .49 | 5 | 35% |
| J | .277 | 3.80 | .34 | 411 | 3 | W | .386 | 5.80 | .51 | 5 | 35/8 |
| K | .281 | 3.90 | .35 | 411 | 3 | X | .397 | 6.00 | .53 | 51/8 | 33/4 |
| ${f L}$ | .290 | 4.00 | .36 | 411 | 2^{31}_{32} | Y | .404 | 6.40 | .55 | 518 | 334 |
| M | .295 | 4.10 | .36 | 414 | $2 \tfrac{31}{3} \tfrac{1}{2}$ | \mathbf{Z} | 413 | 6.80 | .59 | 5)4 | $3\frac{2}{3}$ |

MORSE DRILLS

FITTING SILVER AND DEMING'S AND PRENTICE BLACKSMITH'S DRILL PRESSES, Nos. I AND 2

No. 112 SHORT LENGTHS

STYLE No. 1-SHANKS 12-INCH DIAMETER, 24 INCHES LONG



Fig. 6274A STYLE No. 2—SHANKS 14-INCH DIAMETER. 214 INCHES LONG



| | | | Fig. | 6274B | | | |
|---|---------------|------------------------------|----------------------------|------------------------------|---------------|------------------------------|-------------------------------|
| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches |
| 1 8 1 | . 45 | $51\frac{2}{8}$ | 2-16 | 15 | 1.20 | 6 | $2^{3}4$ |
| | . 45 | $51\frac{\circ}{4}$ | 25 | 23 | 1.20 | 6 | 2^3 |
| 94471466747254747468714657861734 | .45 | 5^3 | 276 | 45 64 23 34 64 | 1.25 | 6 | 2^3 |
| H | .50 | 5^{1}_{2} | 296 | 37 | 1.25 | 6 | 2^{3} |
| 316 | .50 | $53	ilde{4}$ | 2^{13} | 49 64 | 1.30 | 6 | 2^{3} |
| 14 | .55 | $57\frac{1}{8}$ | 27 6 | 35 | 1.30 | 6 | 2^{3} |
| 32 | . 55 | 6 | 3 | 5 <u>1</u> | 1.35 | 6 | $23\hat{4}$ |
| 13 | .60 | 6 | 3 | 13 | 1.35 | 6 | $23\frac{3}{4}$ |
| 14 | .60 | 6 | 3 | 23 | 1.40 | 6 | $2^{3}\frac{7}{4}$ |
| 17 | . 65 | 6 | 234 | 3 2 5 5 | 1.40 | 6 | 234 |
| 32 | .65 | 6 | 234 | <u> </u> | 1.45 | 6 | 2^{3} |
| 19 | .70 | 6 | $2^{3}\frac{7}{4}$ | 77 | 1.45 | 6 | 2^3 |
| 5/6 | . 70 | 6 | 2^3 | 27 | 1.55 | 6 | 2^3 |
| 31 | . 73 | 6 | 231 | 29 | 1,55 | 6 | $2\frac{3}{4}$ |
| 33 | .73 | 6 | 2^{3} | 5 9 6 4 | 1.60 | 6 | $2^3\overline{4}$ |
| 23 | . 75 | 6 | 237 | 157 | 1.60 | 6 | 237 |
| 3 5 | . 75 | 6 | 237 | 61 64 | 1.70 | 6 | 237 |
| 25 4 32 7 4 7 7 4 | . 78 | 6 | $2^{\frac{1}{4}}$ | 31 | 1.70 | 6 | $23\frac{7}{4}$ |
| 13 | .78 | 6 | 234 | 32 63 | 1.80 | 6 | 2^{3} |
| 4 1 | .80 | 6 | $2^3 7$ | 1", | 1.80 | 6 | 2^3 |
| | .80 | 6 | 2^3 | $1_{\frac{1}{32}}$ | 1.90 | 6 ' | 2^{3} |
| 2 <u>9</u> | .83 | 6 | 247 | 1116 | 2.00 | 6 | $23\frac{3}{4}$ |
| 7.26 + 55.14 / 2.34.7.2.5.4 2.36 + 7.35.4 / 2.34.7.2.5.4 | .83 | 6 | 237 | 1_{32}^{30} | 2.10 | 6 | $23\frac{7}{4}$ |
| ži | .85 | 6 | 23 | $1^{\frac{3}{1}\frac{2}{8}}$ | 2.20 | 6 | 2^{3} |
| 1/2 | .85 | 6 | 23 | 1.5. | 2.25 | 6 | 23.7 |
| 33 | .88 | 6 | 2^3 | 1316 | 2.30 | 6 | 237 |
| 32 | .88 | 6 | 2^{3} | 1_{32}^{70} | 2.35 | 6 | 23 |
| 35 | .90 | 6 | $2^3\frac{1}{4}$ | 11, | 2,40 | 6 | 2^3 |
| 916 | .90 | 6 | 2^{3}_{4} | 1_{32}^{9} | 2.50 | 6 | 2^3 |
| 37 | 1.00 | 6 | $23\frac{7}{4}$ | $1^{\frac{3}{5}}_{16}$ | 2.60 | 6 | 23 |
| 18 | 1.00 | 6 | $23\frac{7}{4}$ | 1 👸 | 2.70 | 6 | 23 |
| 39 | 1.05 | 6 | 23 7 | 13, | 2.80 | Ğ | $\overline{2}$ $\overline{3}$ |
| 9 167-4-9019-4 | 1.05 | 6 | $ar{2}_3^{*}_4^{*}$ | $\hat{1}$ $\hat{1}$ | 2.90 | Ğ | $\frac{1}{2}$ 3 $\frac{1}{4}$ |
| 8 1 | 1.10 | 6 | $\overline{2}_{3}^{3}_{4}$ | $\tilde{1}_{16}^{32}$ | 3.00 | Ğ | $\overline{2}$ |
| 312 43 | 1.10 | 6 | $2^{3}\frac{7}{4}$ | 1.5 | 3.10 | 6 | 237 |
| | 1.15 | 6 | 234 | 112 | 3.20 | ĕ | $\frac{1}{23}$ |
| 11 ₁₆ | 1.15 | 6 | 234 | - 3 | | | -/4 |

Style No. 2 always furnished unless otherwise ordered,

MORSE TAPER SQUARE SHANK DRILLS

FITTING RATCHETS

No. 109E



Fig. 6276A

| | | No. 1 Shank | | | | No. 2 Shank | - |
|--|---|--|---|--|--|---|--|
| | SHANK, % X | % x 11/2 INCHE | | S | HANK, 1/2 X | ¾ x 1¾ Inchi | |
| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches |
| 1. 6.27./16.72./4.927./16.12./8.527./16.52./4.527./16.52./4.527./16.52./4.527./16.52./4.527./16.52./4.527./16.52./4.527./16.52./4.527./16.52./4.527./16.52./4.527./16.52./16.52./16.527./16.52./16.527 | .90 .95 .95 .95 .1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.30 1.35 1.40 1.45 1.45 1.55 1.65 1.55 1.65 1.75 1.90 2.05 2.20 2.30 2.40 2.55 2.85 3.35 | 43/6 41/6 41/6 41/6 5 5 5 5 6 61/4 61/2 61/ | 12.35.67.27.66.25.2.2.2.2.2.2.3.4.4.4.4.4.4.4.4.4.4.4.4.4 | 1/8 92 /6 12 /4 92 /6 12 /8 92 /6 92 | .90 .95 .95 .95 1.00 1.05 1.10 1.15 1.20 1.25 1.30 1.35 1.40 1.45 1.45 1.50 1.55 1.65 1.75 1.75 1.90 2.05 2.20 2.30 2.40 2.55 3.35 | 47/6 47/6 417/6 417/6 51/6 55 5 5 6 61/4 61/4 61/4 61/4 61/4 61/4 61/4 61 | 13/16/25/16/16/25/25/16/16/16/16/16/16/16/16/16/16/16/16/16/ |
| $ \begin{array}{c} 13_{16} \\ 11_{4} \\ 15_{16} \\ 13_{8} \end{array} $ | 3.65 3.90 4.20 | 9 9 | 61/6 61/6 61/6 | $ \begin{array}{c} 13_{16} \\ 11_{4} \\ 15_{16} \\ 13_{8} \end{array} $ | 3.65 3.90 4.20 | 9 9 | 67/6 67/6 67/6 67/6 67/6 |
| $\frac{17_{16}}{11_{2}}$ | 4.50 4.80 | 9 | 611/16 611/16 | 17/16 11/2 | 4.50 4.80 | 9 | 67 ₁₆ 67 ₁₆ 67 ₁₆ |

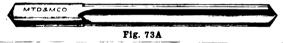
Number 1, Small Shank always furnished unless No. 2 is particularly specified.

Parties ordering Taper Square Shank Drills for Packer Ratchets will please state number of ratchet and name of manufacturer.



MORSE STRAIGHT WAY DRILLS

No. 114A, STRAIGHT SHANK JOBBERS' AND MACHINISTS' SETS



| | | | | | 200 200 000 | | | | | | | | |
|---|--|---|--|---|--|---|---|--|---|--|--|--|---|
| Diam. Inches | Price per Doz. | Price Each | Length Over All Inches | Flute Cut. Ins. Diam. Inches | Price per Doz. | Price Each | Length Over All Inches | Flute Cut, Ins. | Diam. Inches | Price per Doz. | Price Each | Length Over All Inches | Flute Cut , Ins. |
| 1 15 6 4 3 27 6 4 8 6 5 7 1 6 4 8 6 3 4 6 5 7 1 6 8 6 7 1 6 8 6 7 1 | 1.00 1.10 1.20 1.30 1.45 1.60 1.80 2.00 2.20 2.40 | .09 .10 .11 .12 .13 .15 .16 .18 .20 | 21.2 25.8 23.4 27.8 31.4 31.4 31.4 31.7 35.8 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 2.65 2.90 3.15 3.40 3.65 3.90 4.20 4.50 4.80 5.10 | .23 .26 .28 .30 .32 .35 .37 .40 .42 | 37 8 4 41 4 8 41 4 4 4 4 4 4 4 4 4 4 4 4 4 4 | 2233 4 8122 22 7 8 5 15 15 15 15 15 15 15 15 15 15 15 15 1 | 3 2 5 4 3 2 7 1 6 9 4 5 5 2 1 4 4 7 2 6 1 5 2 1 4 4 2 2 1 4 4 4 2 2 1 4 4 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 2 1 4 4 2 1 4 4 2 2 1 4 2 2 1 4 4 2 2 1 4 2 2 1 4 2 2 1 4 2 2 1 4 2 2 1 4 2 2 1 2 1 | 5.40 5.70 6.00 6.40 6.80 7.20 7.50 7.75 8.00 | .48 .50 .53 .55 .59 .63 .65 .67 | 51.8 51.8 51.8 51.8 51.8 51.8 51.8 51.8 | 35 8 34 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |

No. 114B, TAPER SHANK

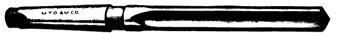


Fig. 73B

| Diam. Inches | Price Each | Length Over All Inches | Flute Cut Inches | Diam. Inches | Price Each | Length Over All Inches | | Diam. Inches | Price Each | Length Over All Inches | Flute Cut Inches |
|---|---------------------|------------------------------|------------------------|-----------------------------------|---------------|---|-----------------|-----------------------------|---------------|------------------------------|------------------------|
| 11 | .60 | 6^{1}_{8} | 3 | 1_{32} | 3.20 | 111_{8} | $6\frac{1}{2}$ | 113/6 | 8.80 | 1614 | 101 3 |
| 2 | .65 | 614 | 2^{15}_{6} | 1 1/16 | 3.40 | 1114 | 653 | $1\frac{27}{32}$ | 9.00 | 1617 | 101 8 |
| 5,6 | .70 | $63\frac{3}{8}$ | 3110 | $1_{3\frac{3}{2}}$ | 3.60 | $\begin{bmatrix} -11!\frac{7}{2} \end{bmatrix}$ | 67. | 17/8 | 9.20 | 1612 | 103 8 |
| 32 5/6 11 32 | .75 | $6\frac{1}{2}$ | 33/16 | $11\frac{1}{8}$ | 3.80 | $11^{3}\frac{7}{4}$ | 71.8 | 1 32 | 9.35 | 161/2 | 103.8 |
| 3 2 | .80 | 63.7 | 3716 | 1 32 | 4.00 | 117% | 713 | 1156 | 9.50 | 161/2 | 101 |
| 13 | .85 | $\frac{634}{7}$ | 3116 | 13/2 | 4.20 | 12 | 73/8 | 131 | 9.65 | 1612 | 1017 |
| 7% | .90 | 71/4 | 3156 | 1 32 | 4.40 | 121/8 | $7\frac{1}{2}$ | 232 | 9.80 | 1613 | 1014 |
| 3 157 1655 2274 157 127 127 127 127 127 127 127 127 127 12 | .95 | 71/2 | 43/16 | 114 | 4.50 | $12^{\frac{1}{2}}$ | 778 | $\overline{2}_{32}^{\perp}$ | 10.20 | 161/3 | 912 |
| 1/3 | 1.00 | 734 | 4716 | $1\frac{9}{32}$ | 4.65 | 1418 | 81/2 | $\frac{1}{2}i_{16}^{32}$ | 10.60 | 17 | 10 2 |
| 17 | 1.10 | 8 * | 411 | 15 6 | 4.80 | 1417 | $85\frac{2}{8}$ | 21% | 11.20 | 17 | 10 |
| 9% | 1.20 | 81/4 | 4 1 3 | $1\frac{1}{3}\frac{1}{3}$ | 5.00 | $14^{3}\frac{1}{8}$ | 834 | 23 3 | 12.00 | 17 | 10 |
| 9/ 16 19 32 | 1.30 | 81/2 | 45 6 | $13\frac{2}{3}$ | 5.20 | 1412 | 87/8 | 214 | 12.80 | 171/2 | 1014 |
| 58 | 1.40 | 834 | 47/8 | $1_{\frac{1}{3}\frac{3}{2}}$ | 5.40 | $14^{5}\frac{2}{8}$ | 9'8 | $\bar{2}_{16}^{*}$ | 13.60 | 1712 | 1018 |
| 31 1 | 1.50 | 9 4 | 518 | 17% | 5,60 | 1434 | 91/8 | 233 | 14.40 | 18 | 1013 |
| 11 / 16 | 1.60 | 914 | 53.8 | $1\frac{1}{3}$ | 5.80 | 147 8 | 914 | 072 | 15.00 | 181/2 | 11 |
| 23 | 1.70 | $91\frac{1}{2}$ | 553 | $\tilde{1}\frac{3}{2}$ | 6.00 | 15 | 93 % | 21/3 | 15.60 | 19 | 113 g |
| 3/2 | 1.85 | $93\frac{2}{1}$ | 578 | 1 1 7 7 | 6.30 | 15 | 93/8 | 2916 | 16.20 | 1914 | 115 8 |
| 25 | $\hat{2}.00$ | 97% | 6 | 1_{16}^{32} | 6.60 | 1514 | $95\frac{8}{3}$ | 25% | 16.80 | 1912 | 1133 |
| 13. | $\frac{2.15}{2.15}$ | 10 | 61 3 | 1 3 2 | 6.90 | 151_4^4 | 05.7 | 211/16 | 17.60 | 20 | 12^{12} |
| 27 | 2.30 | 1014 | 63 3 | $15\frac{32}{8}$ | 7.20 | $15\frac{1}{2}$ | 978 | 234 | 19.00 | $\frac{201}{2}$ | 125 |
| 7% | 2.45 | 101/2 | 65 3 | 1_{32} | 7.50 | 151/2 | 97/8 | 21316 | 20.00 | 201/2 | $12^{5}\frac{8}{8}$ |
| 2021/4502 (67-27/89-2 2023/2023 (2027/202 | $\frac{2.10}{2.60}$ | $10^{5}\frac{2}{8}$ | 634 | 1111 / | 7.80 | 1534 | 1018 | 27_{8}^{16} | 21.00 | $\frac{20}{21}$ | 13 |
| 3.2 15.4 | $\frac{2.75}{2.75}$ | $10^{3}\frac{3}{4}$ | 61.4 | $1^{\circ}_{16} \ 1^{\circ}_{32}$ | 8.10 | 1534 | 911 | $2^{i}_{16}^{8}$ | 23.00 | 21 | 13 |
| 15 16 31 32 | $\frac{2.90}{2.90}$ | 107% | 614 | $1\frac{32}{134}$ | 8.40 | 16 | 9 15 | 3 16 | 25.00 | 22 | 13 |
| 1 32 | 3.00 | 11 | 63 3 | 1額 | 8.60 | 16 | 918 | | 20.00 | | 10 8 |
| - | 3.00 | ** | | - 32 | | | - 16 | | | | |

TAPER SHANK BITS HAVE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive)inches | 1/4 to 16 | 37 to 39 | 59 to 114 | 111 to 2 | 21 to 3 |
|-----------------------------|-----------|----------|-----------|----------|---------|
| Morse Taper Shanknumber | 1 | 2 | 3 | 4 | 5 |

Can be furnished in 64th sizes, at price of next largest size.

MORSE STRAIGHT WAY DRILLS No. 114% B. STRAIGHT SHANK TAPER LENGTH

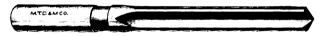


Fig. 6273A

| Diameter Inches | Price Each | Length Over All Inches | Flute Cut Inches | Diameter Inches | Price Each | Length Over All Inches Flute Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Flute Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Flute Cut Inches |
|--|--|--|---|---|--|--|--|--|--|--|---|--|---|--|
| 1 - 935/133/137/131/139/135/231/233/24/3/10 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - | .60 .65 .70 .75 .80 .85 .90 .95 1.00 | 61/8 61/4 63/8 61/2 63/4 7 71/4 71/2 73/4 8 | 4 4 4 4 1/6 4 1/8 4 1/4 4 3/8 4 5/8 5 5 1/4 | 27 7.29 15 16 32 1 1 1 32 1 1 1 8 | 2.30 2.45 2.60 2.75 2.90 3.00 3.20 3.40 3.60 3.80 | 1014 634 1012 7 1058 7 1034 7 1078 718 11 734 1118 734 1114 733 1114 733 1114 733 | 17/652 11/52 11/52 11/53 15/81 | 5.60 5.80 6.00 6.30 6.60 6.90 7.20 7.50 7.80 8.10 | 14 ³ / ₄ 14 ⁷ / ₈ 15 15 15 ¹ / ₄ 15 ¹ / ₄ 15 ¹ / ₂ 15 ³ / ₄ 15 ³ / ₄ | 95 8 93/4 97/8 91/2 93/4 93/4 10 10!4 10!4 | $\begin{array}{c} 2\frac{1}{32} \\ 2\frac{1}{1} \\ 2\frac{1}{1} \\ 2\frac{1}{1} \\ 8 \\ 2\frac{1}{1} \\ 8 \\ 2\frac{1}{1} \\ 4 \\ 2\frac{1}{1} \\ 2\frac$ | 10.20 10.60 11.20 12.00 12.80 13.60 14.40 15.00 15.60 16.20 | 16½ 17 17 17 17½ 17½ 18½ 18½ 19 | 95/8 101/8 101/8 101/4 101/4 105/8 111/8 111/2 113/4 |
| 9/135/231/233/452/6 | 1.20 1.30 1.40 1.50 1.60 1.70 1.85 2.00 2.15 | 814 812 834 9 914 912 934 978 10 | 53 8 55 8 5 5 7 8 6 6 3 8 6 6 5 5 8 6 6 5 5 8 6 6 5 5 8 6 6 5 5 8 6 6 5 5 8 6 6 5 5 8 8 6 6 5 5 8 8 6 6 5 5 8 8 8 8 | $\begin{array}{c} 1 \frac{1}{3} \frac{1}{3} \\ 1 \frac{1}{3} \frac{1}{3} \\ 1 \frac{1}{3} \frac{1}{3} \\ 1 \frac{1}{3} \frac{1}{3} \\ 1 \frac{1}{3} \frac{1}{3} \\ 1 \frac{1}{3} \frac{1}{3} \end{array}$ | 4.00 4.20 4.40 4.50 4.65 4.80 5.00 5.20 5.40 | 117 8 8 12 8 18 12 18 12 18 12 14 18 14 14 14 14 14 14 14 14 14 14 14 14 14 | 1345 1367 1367 1778 1789 1789 1789 1789 1789 1789 | 8.40 8.60 8.80 9.00 9.20 9.35 9.50 9.65 9.80 | 16 16 16 16 16 16 16 16 16 16 16 16 16 1 | 103/4 11 11 11 | 25/8 211/6 23/1 | 16.80 17.60 19.00 20.00 21.00 23.00 25.00 | 191/2 20 201/2 201/2 21 21 22 | $11\frac{7}{8}$ $12\frac{3}{8}$ $12\frac{3}{4}$ |

No. 114C, STRAIGHT SHANK, WIRE GAUGE

M.T.D.&M.C.D.

Pig. 6273B

| Number by Gauge | Price per Dozen | Price Each | Number by Gauge | Price per Dozen | Price Each |
|--------------------|--------------------|---------------|--------------------|--------------------|---------------|
| 1 to 5 | 2.35 | .22 | 26 to 30 | 1.55 | . 15 |
| 6 " 10 | 2.25 | .21 | 31 " 35 | 1.40 | .14 |
| 11 " 15 | 2.10 | . 20 | 36 " 40 | 1.25 | . 12 |
| 16 " 2 0 | 1.95 | .19 | 41 " 45 | 1.10 | . 10 |
| 21 " 25 | 1.75 | .17 | 46 " 60 | .95 | .09 |

CENTER DRILLS



| | No 114E Straight Shank | | | | | | | | | | No. 114F | | | |
|-----------------------------|----------------------------------|--|---------------------------------|---|--------------------------------------|---|-----------------------------|---|--|---|---------------------|----------------------------|------------------------------------|---|
| Diameter Inches | Price per Dozen | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price per Dozen | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price per Dozen | Length Over All Inches | Twist Cut Inches | Wire Gauge Number | Price per Dozen | Length Over All Inches Twist Cut Inches |
| 32 34 1/6 64 32 | .90 .90 .80 .90 1.10 | $\begin{array}{ c c c }\hline 11_8 \\ 11_8 \\ 11_4 \\ 11_4 \\ 11_4 \\ 11_4 \\ \end{array}$ | 5 8 5 8 3 4 3 4 3 4 | 7 64 1\s 64 5 82 11 64 | 1.20 1.25 1.35 1.50 1.70 | $\begin{array}{c c} 11/4 \\ 11/4 \\ 11/4 \\ 11/2 \\ 11/2 \\ 11/2 \end{array}$ | 3/4 3/4 3/4 1 1 | 3/16 13 64 7 32 15 64 14 | $egin{array}{c} 1.90 \\ 2.10 \\ 2.35 \\ 2.60 \\ 2.85 \\ \end{array}$ | $\begin{array}{c c} 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{1}{2} \end{array}$ | 1 1 1 1 | 30 40 45 50 55 | 1.55 1.25 1.10 .95 .95 | $\begin{array}{ c c c c c }\hline 11/4 & 3/4 \\ 11/4 & 3/4 \\ 11/4 & 3/4 \\ 11/4 & 3/4 \\ 11/4 & 3/4 \\ 11/4 & 3/4 \\ \hline \end{array}$ |

SIZES OF TAP DRILLS

FOR TAPS WITH U.S. STANDARD THREAD

| Diam. | Threads | Size of | Diam. | Threads | Size of | Diam. | Threads | Size of | Diam. | Threads | Size of |
|-----------------|---------|---------|--------|---------|----------|----------|---------|------------------|----------------|---------|------------------|
| Tap | per | Drill | Tap | per | Drill | Tap | per | Drill | Tap | per | Drill |
| Inches | Inch | | Inches | Inch | Inches | | Inch | Inches | | Inch | Inches |
| | | | | | The near | THE ITES | Inch | Tiledes | | | |
| 1.1 | 20 | 3/6 in. | 11/16 | 11 | 37 | 114 | 7 | 1.5 | $2\frac{1}{8}$ | 41/2 | $1\frac{27}{32}$ |
| 57 | 18 | C I | 3.7 | 10 | 52 | 13 | ß | 111 | 214 | 41.5 | 1 34 |
| . 16 | | | /4 | | 28 | 1.8 | Ų | 7.64 | 2/4 | 1/2 | 545 |
| 3 8 | 16 | l N | 13/ | 10 | 11/6 | 11/2 | 6 | $1\frac{19}{64}$ | 23/8 | 4 | 2 6 |
| 7/6 | 14 | Si | 7% | 9 | #7 | 15% | 51/2 | 1 2 5 | 21/3 | 4 | 236 |
| 12 | 13 | 13 in. | 152 | ă | 31 | 134 | 5 2 | 117 | -/ 2 | | |
| 72 | | | 15/16 | 0 | 81 | 194 | υ | 1/2 | | | • • • • |
| %6 | 12 | 84 " | 1 | 8 | 33 | 174 | 5 | 15/8 | | | |
| $5\overline{8}$ | 11 | 33 " | 11/8 | 7 | 81 | 2 1 | 41/2 | 1 4 4 | | | |

FOR MACHINE SCREW TAPS

| Size of Tap Number | Size of Drill Number | Size of Tap Number | Size of Drill Number | Size of Tap Number | Size of Drill Number |
|-----------------------|-------------------------|-----------------------|-------------------------|-----------------------|--|
| 2 x 48 | 50 | 9 x 30 | 27 | 17 x 16 | 6 |
| 2 x 56 | 49 | 9 x 32 | 25 | 17 x 18 | 2 |
| 2 x 64 | 48 | 10 x 24 | 25 | 17 x 20 | 2 |
| 3 x 40 | 47 | 10 x 30 | 22 | 18 x 16 | 2 2 2 1 A B C D D F H J |
| 3×48 | 45 | 10 x 32 | $\overline{21}$ | 18 x 18 | 1 |
| 3 x 56 | 44 | 11 x 24 | $\frac{1}{21}$ | 18 x 20 | A |
| 4 x 32 | 43 | 11 x 28 | 17 | 19 x 16 | В |
| 4 x 36 | 42 | 11 x 30 | 17 | 19 x 18 | C |
| 4 x 40 | 41 | 12 x 20 | 19 | 19 x 20 | D |
| 5 x 30 | 40 | 12 x 22 | 17 | 20 x 16 | D |
| 5 x 32 | 40 | 12 x 24 | 17 | 20 x 18 | F |
| 5 x 36 | 38 | 12 x 28 | 15 | 20 x 20 | Н |
| 5 x 40 | 37 | 13 x 20 | 15 | 22 x 16 | J |
| 6 x 30 | 35 | 13 x 22 | 15 | 22 x 18 | L |
| 6 x 32 | 35 | 13 x 24 | 13 | 24×14 | M |
| 6 x 36 | 33 | 14 x 20 | 13 | 24 x 16 | N |
| 6 x 40 | 32 | 14 x 22 | ii | 24 x 18 | 0 |
| 7 x 28 | 32 | 14 x 24 | 9 | 26 x 14 | 0 |
| 7 x 30 | 31 | 15 x 18 | 10 | 26 x 16 | P |
| 7 x 32 | 30 | 15 x 20 | 8 | 28 x 14 | R |
| 8 x 24 | 30 | 15 x 22 | 6 | 28 x 16 | S |
| 8 x 30 | 30 | 15 x 24 | 5 | 30 x 14 | L M N O O P R S U |
| 8 x 32 | 29 | 16 x 16 | 7 | 30 x 16 | V |
| 9 x 24 | 29 | 16 x 18 | 6 | | 1 |
| 9 x 28 | 28 | 16 x 20 | š | | |

For steel work use one or two sizes of drills larger than listed above.

SIZES OF DRILLS FOR PIPE TAPS

Briggs' Standard

| 1/11 | 3/8-37 | 3/4 33 | 1!4 - 1!4 | 2 -2% | 3-31/4 |
|-------------------------------|--------|---------|---------------------------------|-------------------------------|--------|
| $\frac{1}{8} - \frac{11}{32}$ | Z8-64 | /4 = 32 | 1/4 -1./2 | 2 2/16 | /· |
| 1 2 7/ | 1/ 45 | 1 19 | $1\frac{1}{2}$ - $1\frac{2}{3}$ | $2\frac{1}{2}$ $2\frac{5}{8}$ | |
| 14-76 | 1∕2−₹3 | 1 —1.5% | 172-135 | 472478 | |

Reamers should be used for the larger sizes.



SIZES OF TAP DRILLS

FOR TAPS MADE BY MORSE TWIST DRILL AND MACHINE COMPANY
FOR TAPS WITH "V" THREAD

| | TON TAIS WITH | | | | | | | | | | | | |
|--------------------------|------------------------|----------------------------|--------------------------|------------------------|---------------------------------|--------------------------|------------------------|----------------------------|--------------------------|------------------------|----------------------------|--|--|
| Diamt'r Tap Inches | Threads per Inch | Size of Drill Number | Diamt'r Tap Inches | Threads per Inch | Size of Drill | Diamt'r Tap Inches | Threads per Inch | Size of Drill Inches | Diamt'r Tap Inches | Threads per Inch | Size of Drill Inches | | |
| 32 | 48 | 50 | 372 | 24 | No. 20 | 19 | 12 | 31 | 1_{32} | 7 | 14 | | |
| 32 | 52 | 50 | 3 ⁷ 2 | 28 | No. 17 | 19 | 14 | 1/2 | $1\frac{7}{32}$ | 8 | 164 | | |
| 3 32 | 54 | 49. | 7.2 | 30 | No. 16 | 5 8 | 10 | 31 | 11/4 | 7 | 134 | | |
| 32 | 56 | 49 | 7 32 | 32 | No. 15 | 5 8 | 11 | 1/2 | $1_{\frac{9}{32}}$ | 7 | 1.54 | | |
| 33 | 60 | 48 | 15 | 24 | No. 16 | 5 8 | 12 | 33 | 15/16 | 7 | 174 | | |
| 8 ⁷ £ | 32 | 50 | 15 | 28 | No. 12 | $\frac{21}{32}$ | 10 | 33 | $1\frac{11}{32}$ | 7 | 12 | | |
| 6 ⁷ 4 | 36 | 49 | 12 | 32 | No. 10 | 312 | 11 | 17 | 13.8 | 6 | 11/8 | | |
| 5 4 | 40 | 47 | 14 | 18 | No. 17 | 31 | 12 | 35 | 1 133 | 6 | 1 32 | | |
| 8 ⁷ 4 | 48 | 44 | !4 | 20 | No. 14 | 11/16 | 11 | %6 | 17/6 | 6 | 13/16 | | |
| 874 | 56 | 43 | 14 | 24 | No. 9 | 11/16 | 12 | 37 | $1\frac{15}{32}$ | 6 | $1\frac{7}{32}$ | | |
| 1/8 | 32 | 44 | 32 | 16 | No. 10 | 33 | 11 | 12 | $1\frac{1}{2}$ | 6 | 111 | | |
| 1/8 | 36 | 43 | 32 | 18 | 13 in. | 33 | 12 | 39 64 | 1 37 | 6 | 113 | | |
| 1/8 | 40 | 42 | 32 | 20 | No. 3 | 3/4 | 10 | 39 | 1% | 6 | 121 | | |
| 1.8 | 42 | 41 | 516 | 16 | No. 1 | 34 | 11 | 5/8 | 1 132 | 6 | 123 | | |
| 1/8 | 48 | 39 | 516 | 18 | ₹ in. | 34 | 12 | #1 | 15 8 | 5 | 181 | | |
| 9 | 30 | 41 | $\frac{11}{32}$ | 16 | F | 25 32 | 10 | 11 | 15 % | 51/2 | 123 | | |
| 84 | 32 | 40 | 11 | 18 | 17 in. | 25 32 | 11 | $\frac{21}{32}$ | $1\frac{21}{32}$ | 5 | 123 | | |
| 8,4 | 36 | 37 | 3 8 | 14 | J | 35 | 12 | #3 | $1\frac{21}{32}$ | $5\frac{1}{2}$ | 125 | | |
| 84 | 40 | 34 | 3 8 | 16 | L | 13/6 | 10 | 43 | 111/16 | 5 | 125 | | |
| 3 2 3 2 | 30 | 33 | 3 s | 18 | 19 in. | $\frac{27}{32}$ | 10 | # 1 | 1^{11}_{16} | $5\frac{1}{2}$ | 137 | | |
| 3/2 | 32 | 32 | 133 | 14 | N | 78 | 9 | 33 | $1\frac{23}{32}$ | 5 | 187 | | |
| 3 ⁵ 2 | 36 | 31 | $\frac{1}{3}\frac{3}{2}$ | 16 | ${f P}$ | 78 | 10 | 87 | 133 | 51/2 | 122 | | |
| $\frac{5}{32}$ | 40 | 30 | 13 | 18 | }} in. | 32 | 9 | 34 | 134 | 5 | 122 | | |
| 11 | 32 | 30 | 716 | 14 | R | 15/6 | 9 | 33 | $1\frac{25}{32}$ | 5 | 131 | | |
| ## | 36 | 29 | 7/16 | 16 | s | $\frac{31}{32}$ | 9 | 13/6 | 113/16 | 5 | 133 | | |
| 11 | 40 | 28 | 13 | 14 | 3 8 | 1 | 8 | 53 | $1\frac{27}{32}$ | 5 | 135 | | |
| 3/16 | 24 | 29 | $\frac{1}{3}\frac{5}{2}$ | 16 | w | $1\frac{1}{3}g$ | 8 | 55 64 | 17/8 | 41/2 | 135 | | |
| 3/16 | 28 | 28 | 1/2 | 12 | ξ ⁵ in. | 11/6 | 8 | 64 | 178 | 5 | 137 | | |
| 316 | 30 | 27 | $\frac{1}{2}$ | 13 | X | 1_{32}^{3} | 8 | 59 64 | $1\frac{29}{32}$ | 41/2 | 137 | | |
| 3/16 | 32 | 26 | 1/2 | 14 | 13 in. | 118 | 7 | 59 64 | 133 | 5 | 132 | | |
| 3/16 | 36 | 24 | $\frac{1}{3}\frac{7}{2}$ | 12 | ²⁷ ₆₄ in. | 11_8 | 8 | 61 61 | 1,5 | 41/2 | 132 | | |
| 13 | 24 | 26 | $\frac{1}{3}\frac{7}{2}$ | 13 | 27 in. | 1 32 | 7 | 61 | 115/16 | 5 | 141 | | |
| 43 | 28 | 22 | $\frac{1}{3}\frac{7}{2}$ | 14 | 716 in. | 1 32 | 8 | 63 | 131 | 41/2 | 141 | | |
| 13 | 32 | 20 | 9/6 | 12 | 89 in. | 13/16 | 7 | 63 | $1^{\frac{31}{32}}$ | 5 | 143 | | |
| _11_ | 36 | 18_ | 916 | 11 | $\frac{15}{32}$ in. | _1 ³ 6_ | 8 | 1,1 | _2 | 412 | 147 | | |

INDEXED CASES FOR DRILLS

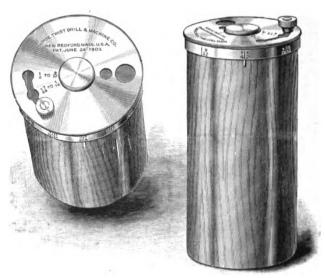


Fig. 6730A

Pig. 6730B

The Drills in Patented Indexed Case, as illustrated above, are contained in holes arranged in concentric circles in the block. Over them is a swinging cover with holes to match each circle. The swinging cover can be moved by the small knob shown so that its holes will register with the holes in the outer cover or Cap. Around the edge of the cap are stamped the sizes of the various drills. The cap is turned to bring any size in line with an index mark and by inverting the case the selected drill will drop out.

CASES WITHOUT DRILLS

| ≓ No. | 5A | holding | Straight | Shank | Drills | s 16 to 1 | s inch | by 64t | hs | eac | h l | 1.25 |
|----------|-----|---------|-----------|----------|--------|-----------|---------|-----------------------|---------|---------|-----|------|
| ** | 6A | " | 46 | " | " | 16 " 1 | ž " | " 32r | ds | | • | 1.25 |
| 44 | 7A | ** | 44 | " | " | | | | nch | | ٠ | 1.25 |
| " | 8A | ** | Steel Wi | re Gaus | ze Dr | | | | | | ٠ | 1.25 |
| ** | 9A | ** | Half Set | | | | | | | | ٠ | 1.25 |
| ** | 12A | 44 | Machine | Bits. 1 | i to 1 | 6 inch l | ov 32nd | ls | | • | . | 1.25 |
| •• | 13A | • • | Bit Stock | CDrills, | 16 to | inch b | y 32nd | 3, 5 ₁₆ to | inch by | 16ths ' | | 1.25 |

CASES WITH SETS OF DRILLS

| No. | 5A (| Case | with | Set | Straight | Shank | Drills, | $\frac{1}{16}$ to $\frac{1}{2}$ inch by | 64thse | ach | 11.50 |
|-----|----------|-------|------|-----|-----------|-----------|---------|---|--------------|-----|-------|
| ** | 6A | ** | | ** | ** | ** | 44 | 16 " 1/2 " " | 32nds | ** | 6.90 |
| •• | 7A | ** | ** | | " | 44 | ** | No. 60 to 3 inch | 1 | ** | 11.40 |
| ** | 8A | " | •• | ** | •• | " | " | Steel Wire Gauge | , No.1 to 60 | 44 | 9.60 |
| ** | 9A | ** | | Hal | f Set Dri | lls, alte | rnate r | numbers, No. 1 to | 59 | 44 | 5.80 |
| ** | 12.1 | ** | ** | Set | Machine | Bits, 1 | 6 to 16 | inch by 32nds | | ** | 8.50 |
| • • | 13A | ** | ** | ** | Bit Stock | c Drills | Lik to | 14 inch by 32nds | and 5% to | | |
| | 3 s b | y 16t | hs | | | | | | | 46 | 4.10 |



MORSE DRILLS IN SETS

WIRE GAUGE, JOBBER'S AND LETTER SIZE DRILLS
MOUNTED ON WOODEN BLOCKS

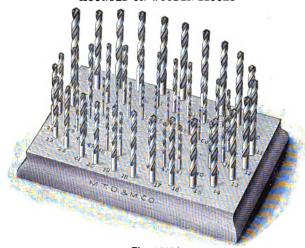


Fig. 6302A

| Number | DESCRIPTION | Price |
|--------|--|-------|
| 5 | Jobber's Straight Shank Drills, 1/6 to 1/2 inches by 64ths per set | 10.00 |
| 6 | " " 1/16 " 1/2 " " 32ds " | 5.40 |
| 7 | " and Wire Gauge Drills, 65 Drills, | |
| | from No. 60 to 3 g-inch | 9.90 |
| 8 | Steel Wire Gauge Drills, Nos. 1 to 60 | 8.10 |
| 9 | " " " Half Set, Alternate Numbers, 1 | |
| | to 59 " | 4.30 |
| 15 | Straight Shank Drills, Letter Sizes, A to Z " | 10.00 |

Price of block only 35 cents.

SETS OF BIT STOCK DRILLS



Fig. 6302B

| Number | DESCRIPTION | Price |
|--------|---|-------|
| 13 | 1/6 to 1/4-inch by 32ds. 5/6 to 3/8 by 16ths, Boxedper set | 2.60 |
| 14 | One each, $\frac{2}{82}$, $\frac{3}{34}$, $\frac{4}{32}$, $\frac{5}{82}$, $\frac{6}{32}$, $\frac{7}{32}$, $\frac{8}{82}$, $\frac{10}{32}$, $\frac{18}{8}$ inches, in Round Polished Wood Case | 2.75 |

SET OF STRAIGHT SHANK MACHINE BITS



Fig. 6302C

| Number | DESCRIPTION Price | |
|--------|-------------------------|--|
| 12 | 1/8 to 1/2-inch by 32ds | |

MORSE MACHINE BITS, ETC.

MACHINE BITS FOR WOOD

TAPER LENGTHS FITTING PRENTICE BLACKSMITHS' DRILL PRESSES, Nos. 1 AND 2
No. 108A



Fig. 6301A

| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | | Price Each | Length Over All Inches | Cut | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches |
|---|---------------|---------------------------------|------------------------|------------------------------|---------------|---------------------------------|--|--------------------|---------------|---------------------------------|------------------------|
| 18 | .50 | 45 8 | 1136 | $\frac{17}{32}$ | 1.30 | 8 | 43/4 | 136 | 3.00 | 1034 | 71.2 |
| 37 | .50 | 478 | $2\frac{3}{32}$ | 216 | 1.40 | 814 | 5 1 | 33 | 3.20 | 1078 | $75\sqrt{3}$ |
| 3/6 | .60 | 5 | 256 | 32 | 1.50 | 81/2 | 51/4 | 1 1 1 | 3.40 | 11 | 73 8 |
| 7 1 | .60 | 5!4 | 2 3 2 | 5 % | 1.60 | 83.7 | 51/2 | 11/6 | 3.60 | 1114 | 75.8 |
| 14 | .70 | 618 | 3 | 33 | 1.70 | 9 | $5\frac{1}{4}$ | 11% | 4.00 | 1134 | 8 |
| 32 | .75 | 614 | 3 | 11.7 16 23 32 34 | 1.80 | 914 | 6 - | 13/6 | 4.40 | 12 | 814 |
| 576 | .80 | 6^{3} 8 | 318 | 33 | 1.90 | 91/2 | 61/4 | 114 | 4.80 | 121/2 | 85 8 |
| 113 | .85 | 6^{12} | 31/4 | 34 | 2.00 | 934 | 61/3 | 156 | 5.20 | $12\frac{1}{2}$ | 85.8 |
| 3/8 | .90 | 63/4 | 31/2 | 33 | 2.20 | 978 | 65/8 | 13.8 | 5.60 | 121/2 | 81/2 |
| 13 | . 95 | 7 | 33/4 | 136 | 2.40 | 10 | 634 | 17/6 | 6.00 | 121/2 | 812 |
| 7/6 | 1.00 | 714 | 4 | 33 | 2.50 | 1014 | 7 | 11/2 | 6.40 | 1213 | 83 3 |
| 13 | 1.10 | 71/2 | 414 | | 2.60 | 101/2 | 714 | | | | |
| 1/2 | 1.20 | 734 | 41/2 | 32 32 | 2.80 | 105 % | 73/8 | | | | |
| 37 - 4 - 22 - 16 - 17 - 2 - 16 - 17 - 2 - 16 - 17 - 18 - 18 - 18 - 18 - 18 - 18 - 18 - 18 | 1.10 | 71/2 | 414 | 37.8 | 2.60 | | $\begin{bmatrix} 7 \\ 7 \end{bmatrix}_4$ | 11/2 | | 121/2 | 83 8 |

The above Drills have Shanks 1/2 inch diameter and 21/2 inches long.

BIT STOCK DRILLS FOR METAL OR WOOD

No. 109



Fig. 6301B

| Diameter Inches | Price per Dozen | Price Each | Length Over All Inches | Twist Cut Inches | Length From Shank To Point Inches | Diameter Inches | Price per Dozen | Price Each | Length Over All Inches | Cut | Length From Shank To Point Inches |
|-------------------------|-----------------------|---------------|---------------------------------|----------------------------|---|---------------------------|-----------------------|----------------|---|--------------|---|
| .116 -3 | $\frac{1.50}{1.65}$ | .14 .16 | $\frac{3^{5}}{3^{5}}$ | 7.8 11.7 | 1½ 1¾ | 716 15 32 1/2 | 8.80 9.60 | .75 .82 | $\frac{614}{658}$ | 4 43 ś | 416 |
| | 2.10 | .20 | 35/8 | $\frac{134}{2}$ | 28 | $\frac{12}{17}$ | 10.30 | .87 .92 | 634 | 476 | 5 |
| 32 | 2.60 3.10 | .29 | 3 § 4 5 | $\frac{1}{2}$ 5/6 | 235 235 | 17 3 2 9 2 16 | 14.35 | 1.20 | 71/2 | 5376 5316 | 534 534 |
| 3 ¹ 2 1/4 | 3.60 4.10 | .33 .38 | $\frac{411}{58}$ | $\frac{2^{5}}{3^{3}_{16}}$ | $\begin{bmatrix} 3\frac{7}{14} \\ 3^{\frac{7}{16}} \end{bmatrix}$ | 5 /8 11 ₁₆ | 16.15 17.95 | 1.35 1.50 | $\begin{array}{c c} 71\frac{7}{2} \\ 71\frac{7}{2} \end{array}$ | 516 516 | $\frac{534}{534}$ |
| 32 5/6 | 4.70 5.40 | .43 .48 | 53 , 51/3 | $\frac{3^3}{3^{1/2}}$ | 41% | 3 4 13 6 | $19.75 \\ 21.55$ | $1.65 \\ 1.80$ | $7\frac{1}{2}$ | 5 5 | 53. 53. |
| 111 32 3 6 | 6.30 7.20 | $.54 \\ .62$ | 57 \$ 57 \$ | $\frac{373}{373}$ | 45 { 45 } | 13 / 16 / 7 / 8 15 / 16 | 23,35 25,75 | $1.95 \\ 2.15$ | $7\frac{1}{2}$ | 5 415/6 | 53.4 53.4 |
| 13 | 8.00 | .68 | 57 S | $35\frac{3}{8}$ | 418 | 1 16 | 28.15 | 2.35 | $71\frac{2}{2}$ | 415 16 | $53\frac{3}{4}$ |

SETS OF BIT STOCK DRILLS

| Number | Description | Price |
|--------|--|-------|
| 13 | $\frac{1}{6}$ to $\frac{1}{4}$ inch by 32nds, $\frac{5}{6}$ to $\frac{3}{8}$ by 16ths, boxedper set | 2.60 |
| 14 | One each, $\frac{2}{32}$, $\frac{3}{32}$, $\frac{4}{32}$, $\frac{5}{32}$, $\frac{6}{32}$, $\frac{7}{32}$, $\frac{8}{32}$, $\frac{19}{32}$, $\frac{12}{32}$ inches in | |
| | Round Polished Wood Case | 2.75 |

MORSE MACHINE BITS

FOR WOOD

No. 108 STRAIGHT SHANKS



Fig. 6303A

| | | | | | | | | | · · | | |
|---------------------------------|---------------|---------------------------------|------------------------|------------------------|---------------|---------------------------------|-------|--------------------|---------------|---------------------------------|------------------------|
| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches |
| 1.8 | .20 | 3 | 113/16 | 3 2 | .95 | 61/8 | 4 1 2 | 15/6 | 2.65 | 9 | 613/6 |
| | .25 | $3\frac{1}{4}$ | $2\frac{3}{32}$ | 9% | 1.00 | 614 | 4116 | 312 | 2.85 | $9\frac{1}{4}$ | 7 |
| 3 ⁵ 2 3 16 | .30 | 31/2 | 25/6 | 18 | 1.10 | 63 8 | 43/4 | 1 1 1 | 3.00 | 912 | 73/6 |
| 32 32 | .35 | 334 | $2\frac{17}{32}$ | 9 16 192 55 5 | 1.15 | 61/2 | 47/8 | 1,16 | 3.60 | 111/4 | 81/2 |
| 174 | .40 | 4 | 23/4 | 21 32 | 1.25 | 634 | 5 | 11/8 | 4.00 | $11\frac{3}{4}$ | 878 |
| . <u>. 9.</u> 1 | .45 | 414 | $2\frac{31}{32}$ | ii, | 1.35 | 7 | 55/6 | 13/6 | 4.40 | 12 | 9 |
| 32 5/16 | .50 | 41/2 | 33/6 | 33 | 1.50 | 714 | 51/2 | 11/4 | 4.80 | 121/2 | 93/8 |
| 112 | . 55 | 43/4 | 313 | 3/4 | 1.65 | 71/2 | 5i17 | 15% | 5.20 | $12\frac{1}{2}$ | 93/8 |
| 3 8 | .65 | 5 | 35% | 33 | 1.80 | $73\frac{7}{4}$ | 57/8 | 13/8 | 5.60 | 121/2 | 93/8 |
| 13 | .70 | $5\frac{1}{4}$ | 337 | 137 | 1.95 | 8 | 6/16 | 17/16 | 6.00 | $12\frac{1}{2}$ | 93/8 |
| 7 6 | . 75 | 51/2 | 416 | 11 | 2.15 | 814 | 61/1 | 11/2 | 6.40 | $12\frac{1}{2}$ | 93/8 |
| 131 7 16 15 | . 80 | $5\frac{3}{4}$ | 4 9 32 | 11 /8 | 2.30 | 81/2 | 67/6 | | | | |
| 1/2 | .85 | 6 | $4\frac{1}{2}$ | 32 | 2.50 | 83/4 | 65/8 | | | | |

No. 108B TAPER SHANKS



Fig. 6303B

| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches |
|-----------------------------------|---------------|---------------------------------|--|-----------------------------------|---------------|---------------------------------|------------------------|--------------------|---------------|---------------------------------|------------------------|
| 18 | .50 | 45% | 113/6 | 43 | 1.30 | 8 | 411/16 | 15/6 | 3.00 | 103/4 | 61/4 |
| 5 32 | .50 | 47/8 | $2\frac{3}{32}$ | 17 16 916 | 1.40 | 81/4 | 4176 | 31 | 3.20 | 10 1/8 | 63/8 |
| 3/6 | .60 | 5 | $egin{array}{c c} 2\frac{5}{16} \\ 2\frac{17}{32} \end{array}$ | 19 32 5 8 | 1.50 | 81/2 | 45 8 | 1 | 3.40 | 11 | 61/2 |
| 1,7 | .60 | 51/4 | 2 17 | 5 8 | 1.60 | 834 | 415/6 | 11/6 | 3.60 | -11!4 | 63/4 |
| <u>;</u> ; | .70 | 61/8 | 3 | 312 1176 | 1.70 | 9 | 5% | 11/8 | 4.00 | 1134 | 71/4 |
| 2 | .75 | 614 | 215/6 | 11/6 | 1.80 | 914 | 57/6 | 13/6 | 4.40 | 12 | 712 |
| 32 5/6 | .80 | 63 8 | 31/6 | 3/4 252 3/4 252 | 1.90 | 91/2 | 511/6 | 11/4 | 4.80 | 121/2 | 8 |
| 11 | .85 | $6\frac{1}{2}$ | 33/16 | 3/4 | 2.00 | $9\sqrt{4}$ | 515 | 15/6 | 5.20 | 1414 | 83/4 |
| 3 8 | .90 | 63/4 | 37/6 | 35 | 2.20 | 97/8 | 6116 | 1^3 g | 5.60 | 141/2 | 9 |
| 13 | .95 | 7 | 311/6 | 137 26 27 37 37 37 | 2.40 | 10 | 63/16 | 17/16 | 6.00 | 1434 | 914 |
| 7/6 | 1.00 | 71/4 | 313/6 | 37 | 2.50 | 101/4 | $6\frac{7}{16}$ | 11/2 | 6.40 | 15 | 91/2 |
| 132 7 16 15 17 1/2 | 1.10 | 71/2 | 4376 | 1 /8 | 2.60 | 101/2 | 611/16 | | | | i |
| 1/2 | . 1.20 | 73/4 | 4 7/6 | 38 | 2.80 | 105 8 | 6136 | | | | |

TAPER SHANK BITS HAVE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive)inches | 1/2 to 92 | 12 to 22 | 18/2 to 11/2 | 15/2 to 11/2 |
|-----------------------------|-----------|----------|--------------|--------------|
| Diameters (Inclusive) | 78 to /16 | 32 10 32 | 76 60 174 | 1/16/01 5 |
| Morse Taper Shanknumber | 1 | ${2}$ | 3 | 4 |

No. 108 Straight Shank Bits, in sets, 1/8 to 1/2-inch Mounted, varying by 32nds, per set, 7.00

TAPER



| = | |
|--------------------------------|----------------------|
| Diameter Inches | P: E: |
| 1/8 37 346 | |
| 27. 27. 1.4. 1.4. | .1717.8 |
| 216 112 28 132 132 | .87 .90 .95 |
| 12 | 1.00 1.10 1.20 |
| | mb. |

The .

| Diameter Inches | Price per Dozen | Pr Eac | |
|---|--|---|-------------|
| 116 27 86 77 1 4 27 16 17 8 39 47 16 17 8 39 47 16 17 18 39 47 18 18 18 18 18 18 18 18 18 18 18 18 18 | 1.50 1.65 2.10 2.60 3.10 3.60 4.10 4.70 5.40 6.30 7.20 8.00 | .1- .16 .20 .24 .29 .33 .38 .43 .48 .54 .62 | ; 5 5 |
| | | _ | _ |

Number 13 14

| lÇ to 1. i | nch by 32 |
|------------|-----------------------------------|
| One ench | 11011 07 02 |
| One each | $\frac{2}{32}$, $\frac{8}{32}$. |
| Kounc | l Polished |

| _ | _: | T w 151 |
|---|--|--|
| | • 🗻 . | Car |
| | | Inches |
| | | |
| | -5- ± | 974 |
| | | 101 |
| | 7. | QII. |
| _ | | 012 |
| • - | -"[| 97)6 |
| - | -15 | gr _K |
| | 1 | 101, |
| | 16 | 101 |
| - | 7.11 | 103 |
| | - | 103 |
| • | | 10.8 |
| | .' * 2 | 10,1 |
| - | 2002 | 1014 |
| - | 100 | 1017 |
| • | -y:: 🕽 | 91. |
| | : | 10 2 |
| _ | | 10 |
| • | | 10 |
| | - 1 | 10 |
| • | 17 | 10 |
| ±. • | | 10 |
| • | | 1014 |
| | 74. - | 101 |
| · | | 10.3 |
| | 2 | 1018 |
| • | - 2 | 1018 |
| - | • | 105 ₈ |
| • | | 1015 |
| | | 11 |
| | | 11 |
| *1 | - | 1117 |
| | 7 | 1127 |
| • • | ~* ⁷ . | 1198 |
| ٠1 | - 1 | 1138 |
| -21 | - 4 | 115.8 |
| | 24 | 117% |
| -44 | 44.0 | 113 |
| , | | 1917 |
| | -41 | 191 |
| •• | | 103 / |
| • • | | 1294 |
| O | 분 - 2 | 123/8 |
| ij | 22 | 12^5 $_8$ |
| · · () | <u> 3</u> - , | 12^{5} s |
| 0 1 | <u>. </u> | 1314 |
| - 0 | 4 | 13 |
| - 11 | * : | 13 |
| '' | | 10 |
| 2 0 | - | 19 |
| | == | 14 |
| 200000000000000000000000000000000000000 | | Twist Crit Crit Crit Crit Crit Crit Crit Cri |
| - | | |

| | ~ | - | | ٠ د | | FULLUMS | | | | | |
|---|---------|---|---|-----|---|---------|----|--------|----|------|--|
| 4 | _ | - | : | •- | u | | 14 | to 2 | 24 | to 3 | |
| ~ | | • | | | 5 | - | | 4 | | 5 | |
| | | _ | | | | | | | | | |

MORSE THREE-GROOVE DRILLS

No. 104G, STRAIGHT SHANK



Fig. 425A

| Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Shank Inches | Length Shank Inches | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Shank Inches | Length Shank Inches |
|---|---------------------|---|------------------------|--------------------------|----------------------------|--|----------------------|---------------------------------|--|--------------------------|--------------------------------------|
| 1,4 | 1.30 | 61/8 | 37/8 | 14 | 11/2 | 1 44 | 7.65 | 151/2 | 1134 | 1!4 | 3 |
| 2 | 1.40 | 614 | 4 | 17 | $1\frac{1}{2}$ | 11116 | 7.90 | 153 | 12 | 11/4 | 3 3 3 3 3 3 3 3 3 3 3 3 3 |
| 5/2 5/2 | 1.50 | 63/8 | 41/8 | 17 | $11\frac{2}{2}$ | 133 | 8.15 | $15\frac{3}{4}$ $15\frac{3}{4}$ | 12 | 11/4 | 3 |
| 110 | 1.60 | 61/2 | 414 | 17 | $1\frac{1}{2}$ | 13_{4}^{32} | 8.40 | 16 | 117/8 | 1,4 | ž |
| 3.4 | 1.70 | 634 | 414 | 3 2 | 134 | 135 | 8.60 | 16 | 1178 | 114 | วั |
| 13 | 1.75 | 7 | 41/2 | 3 3 | 134 | 113/6 | 8.80 | 161/4 | 1218 | 114 | 3 |
| 32 7/ | 1.80 | 71/4 | 434 | 3 3 | 134 | 137 | 9.00 | 1614 | 1218 | 114 | 3 |
| 135 | 1.85 | 71/2 | 5 | 3.5 | 134 | $\begin{vmatrix} 1\frac{32}{7/8} \end{vmatrix}$ | 9.20 | 1612 | 1214 | 114 | 3 |
| 32 | 1.90 | 734 | 5 | 12 | 2 4 | 139 | 9.35 | 161/2 | 1214 | $\frac{1)4}{1!4}$ | 9 |
| 17 | 1.95 | 8 4 | 514 | 12 | | 115/6 | 9.50 | 161/2 | 1214 | 114 | 3 |
| 32 | $\frac{1.00}{2.00}$ | 814 | $5\frac{1}{2}$ | 72 | 2 2 2 | 131 | 9.65 | 161/2 | 1214 | 114 | 9 |
| 716 | $\frac{2.30}{2.30}$ | 817 | 534 | 72 | 5 | $\frac{132}{2}$ | 9.80 | 161/2 | $12\frac{12}{8}$ | 114 | 9 |
| 32 | 9.00 | 81/2 | 53/4 | 72 | 91/ | 9 1 | $\frac{9.80}{10.20}$ | 161/2 | 113/4 | 114 | 91/ |
| 14.20.14.20.14.24.24.24.24.24.24.24.24.24.24.24.24.24 | $2.60 \\ 2.70$ | 8 ³ ⁄ ₄ | $\frac{5^{3}4}{6}$ | | $\frac{\overline{2}!}{2!}$ | $2\frac{1}{32}$ $2\frac{1}{16}$ | 10.20 | $16\frac{1}{2}$ | 119/4 | $\frac{11_{2}}{11_{2}}$ | 3½ 3½ |
| 32 | | 01/ | | 28 | 214 | 2 16 | | | 1214 | 11/2 | |
| 216 | 2.75 | 914 | 61/4 | 2/8 | 217 | $\frac{2^{3}}{3^{2}}$ | 10.90 | 17 | 1214 | 11/2 | 31/2 |
| 32 | 2.85 | 91/2 | 61/2 | 38 | 214 | $\begin{array}{c} 21/8 \\ 2\frac{5}{2} \end{array}$ | 11.20 | 17 | 121/8 | 11/2 | 31/2 |
| % | 2.90 | 934 | 634 | 24 | 217 | 232 | 11.60 | 17 | 1218 1218 | 11/2 | 31/2 |
| 32 | 3.00 | 978 | 678 | 24 | 214 | $\frac{2\frac{3}{16}}{2\frac{7}{32}}$ | 12.00 | 17 | 121/8 | 11/2 | 31/2 |
| 16 | 3.05 | 10 | 7 | *4 | 214 | 2_{32} | 12.40 | 171/2 | 125 | 11/2 | 31/2 |
| 33 | 3.15 | 1014 | 714 714 | 34 | 214 | 2^{12} | 12.80 | 171/2 | $12\frac{1}{2}$ $12\frac{1}{2}$ | $1\frac{1}{2}$ | 31/2 |
| 1/8 | 3.20 | 101/2 | 724 | <u> </u> | 21/2 | $\frac{29}{32}$ | 13.20 | 171/2 | $12\frac{1}{2}$ | 11/2 | 31/2 |
| 33 | 3.30 | 105/8 | 73 8 | <u> </u> | $2\frac{1}{2}$ | 2% | 13.60 | 171/2 | 121/2 | 11/2 | 31/2 |
| 16 | 3.40 | 1034 | 7½ 75% | 28 | 21/2 | 211 | 14.00 | 18 | 13 | 11/2 | 31/2 |
| 312 | 3.50 | 107/8 | 75 8 | | $2\frac{1}{2}$ | 23.5 | 14.40 | 18 | 127/8 | 11/2 | 31/2 |
| 1 | 3.60 | 11 | 71/2 | 1 | $23\overline{4}$ | 213 | 14.70 | 181/2 | 133.8 | 11/2 | 31/2 |
| $\frac{1}{32}$ $\frac{1}{16}$ | 3.70 | 111/8 | 75 8 | 1 | 234 | 27/4 | 15.00 | 181/2 | 133/8 | 11/2 | 31/2 |
| 11/6 | 3.80 | 111/4 | 734 | 1 | 23/ | 244 | 15.30 | 19 | 134 | $1\frac{1}{2}$ | 31/2 |
| $\frac{1}{1}\frac{32}{8}$ | 3.90 | $\begin{array}{c} 111\frac{1}{2} \\ 11\frac{3}{4} \\ 11\frac{7}{8} \end{array}$ | 8 | 1 | 234 | $2\frac{1}{2}$ | 15.60 | 19 | 133/4 | $1\frac{1}{2}$ | $\frac{31/2}{31/2}$ |
| 11/8 | 4.00 | 113/4 | 814 | 1 | 23/ | 21/2 | 15.90 | 1914 | 14 | 11/2 | 31/2 |
| 1 5, | 4.00 4.25 | 117/8 | 83 6 | 1 | 23/4 | 2976 | 16.20 | 1914 | 14 | 11/2 | 31/2 |
| 13% | 4.50 | 12 | 81/2 | 1 | 23/1 | 248 | 16.50 | 191/6 | 141/4 | 11/2 | 31/2 |
| $1\frac{f}{32}$ | 4.65 | 121/8 | 85.6 | 1 | 23/4 | 256 | 16.80 | 191/2 | 141% | 11/2 | 31/2 |
| $1\frac{5}{32}$ $1\frac{5}{6}$ $1\frac{7}{32}$ $1\frac{7}{4}$ | 4.80 | 121/2 | 83/ | 1!4 | 3 | $2\frac{21}{32} \ 2\frac{1}{16}$ | 17.35 | 20 | 1456 | 11/2 | 31/2 31/2 31/2 31/2 31/2 |
| $\frac{1}{32}$ $\frac{1}{5}$ | 5.00 | 1416 | 103 8 | 194 | 3 | 20% | 17.90 | 20 | 145 | $1^{1/2}$ | 31.3 |
| 15% | 5.20 | 14 1/4 | 101/6 | 11/4 | 3 | $2\frac{23}{3}$ $2\frac{3}{4}$ | 18.45 | $20\frac{1}{2}$ | 151/8 | 11/2 | $31\frac{7}{2}$ |
| 144 | 5.40 | 143 8 | 105% | 11/4 | 3 | 23/4 | 19.00 | 201/2 | 15 0 | $1\frac{1}{2}$ | 31/2 |
| 13% | 5.60 | 141/2 | 103/4 | 11/4 | 3 | 233 | 19.50 | 201/2 | 141/2 | 13/4 | 4 |
| 1 🙀 🕛 | 5.80 | 145/8 | 107/8 | 11/4 | 3 | 2136 | 20.00 | 201/2 | 1412 | 13/4 | 4 |
| 13/8 1 13 1 7/6 | 6.00 | 143/ | 11 | 11/4 | 3 | 237 | 20.50 | 21 | 15 | 134 | 4 |
| 143 | 6.20 | 1478 | 111/8 | 117 | 3 | $\frac{1}{2}\frac{17}{52}$ $\frac{17}{27}$ | 21.00 | $\frac{1}{21}$ | 147% | 134 | |
| 11/2 | 6.40 | 15 | 1114 | 11/4 | 3 3 3 3 3 3 3 3 3 3 | 232 | 22.00 | $\frac{1}{21}$ | 147% | 134 | 4 |
| *1 11 | 6.65 | 15 | 111/4 | 11/4 | 3 | 215% | 23.00 | 21 | $\begin{vmatrix} 147\frac{2}{8} \\ 147\frac{2}{8} \end{vmatrix}$ | $13\frac{7}{4}$ | 4 |
| 737 | 6.90 | 1514 | 111/2 | 114 | 3 | $\begin{array}{c} 2_{3_{1}^{16}}^{16} \\ 2_{3_{2}^{1}}^{16} \end{array}$ | 24.00 | 22 | 1578 | 134 | 4 |
| 1 2/2 | | | | | , - | - 17 | | . ~~ | 10 1 | | |
| 148 | 7.15 | 151 | 111/2 | 11/4 | 3 | 3 ** | 25.00 | 22 | 153/4 | 134 | 4 |

^{*}Drills $1\frac{33}{64}$ inches and larger take a different discount than $1\frac{1}{2}$ -inch and smaller.

MORSE FOUR-GROOVE DRILLS

No. 102G, MORSE TAPER SHANK



Fig 131A

| rig 131A | | | | | | | | | | | |
|---|---------------------|---|------------------------------|--|----------------|-----------------------------------|----------------------------|---|------------------|---------------------------------|------------------------|
| Diam. Inches | Price Each | Length Over All Inches | ŧ | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches |
| 1/2 | 1.90 | 734 | 4716 | 1 24, | 3.90 | 111_{2} | 67 8 71 8 71 8 | $\frac{178}{132}$ | 9.20 | 161/2 | 103 8 |
| 23 | 1.95 | 8 | 41176 | $\begin{bmatrix}1&3^{\frac{1}{2}}\\1&6&4\end{bmatrix}$ | 4.00 | 1134 | 718 | 1 33 | 9.35 | 161/2 | $10^{3} \mathrm{s}$ |
| N. 2547-2154 | 1.95 | 8 | 411/6 | 11/8 164 | 4.00 | $113\frac{7}{8}$ $117\frac{7}{8}$ | 71/8 | 113/6 | 9.50 | $16\frac{1}{2}$ | 1014 |
| 35 | 2.00 | 814 | 4156 | 164 | 4.25 | 117% | 714 | 137 | 9.65 | $16\frac{1}{2}$ | 1014 |
| 9 16 17 16 1924 | 2.00 | 814 | 413/6 | 12 | 4.25 | 1178 | 71_{4-1} | $2^{\frac{32}{2}}$ $2^{\frac{1}{32}}$ $2^{\frac{1}{16}}$ $2^{\frac{3}{32}}$ | 9.80 | 1612 | 1014 |
| • 87 | 2.30 | 81/2 | 45 á | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 4.50 | 12 | 73/8 | $2\frac{1}{32}$ | 10.20 | 1612 | 912 |
| 13 | 2.30 | 81 2 | 45/8 | 13/6 | 4.50 | 12 | 73 2 | 2116 | 10.60 | 17 | 10 |
| 39 | 2.60 | $83\frac{7}{4}$ | 478 | 1.3 | 4.65 | 121 8 | 712 | $2\frac{3}{32}$ | 10.90 | 17 | 10 |
| 2.8 | 2.60 | 834 | 478 | 1_{67}^{13} 1_{32}^{7} 1_{67}^{15} | 4.65 | 1218 | $7\frac{1}{2}$ | $\frac{2^{1}}{3}$ $\frac{5}{32}$ | 11.20 | 17 | 10 |
| 61 71 72 | 2.70 | 9 | $51\frac{3}{8}$ | 164 | 4.80 | 121/2 | $77\frac{7}{8}$ | $\frac{23}{32}$ | 11.60 | 17 | 10 |
| 32 | 2.70 | 9 | 51% | 114 | 4.80 | 12^{1}_{2} | 778 | $2\frac{3}{16}$ $2\frac{3}{12}$ | 12.00 | 17 | 10 |
| 13 64 11 16 | 2.75 | 91_{4} | 53 8 | 161 | 5.00 | 1418 | 81/2 81/2 | 232 | 12.40 | 171/2 | 101.5 |
| ``16 | $2.75 \\ 2.85$ | 914 | 538 | 1 32 | 5.00 | 1418 | 85 8 | 217 | $12.80 \\ 13.20$ | $\frac{17!}{2}$ $17!}{2}$ | 101 s 101 s |
| 45 64 23 | 2.85 | $\begin{array}{c} 91\frac{7}{2} \\ 91\frac{7}{2} \end{array}$ | 55 3 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | $5.20 \\ 5.20$ | $\frac{14}{14}$ | | $\frac{2_{32}^{0}}{2_{16}^{5}}$ | 13.60 | $17\frac{1}{2}$ | 1013 |
| 32 | $\frac{2.89}{2.90}$ | $9^{\frac{3}{4}}$ | 55 8 57 6 | 1 21 | 5.40 | 143 | | 276 | 14.00 | | 10.8 |
| 84 | $\frac{2.30}{2.90}$ | 03/ | 57 g 57 g | 121 | 5.40 | 143/8 | $\frac{834}{834}$ | $2\frac{11}{32}$ | 14.40 | 18 | 101.5 |
| 3247-4 /4/D-4-524 | 3.00 | $93\frac{7}{8}$ | 6 8 | 1 11 1 2 2 1 | 5.60 | 141/5 | 87 8 | 23 8 213 276 | 14.70 | 1814 | 11 |
| 25 | 3.00 | 97.8 | 6 | 13 | 5.60 | 1412 | 87 8 87 8 | 272 272 | 15.00 | 1812 | 11 |
| 51 | 3.05 | 10 | 618 | $\begin{vmatrix} 13 \frac{2}{8} \\ 167 \end{vmatrix}$ | 5.80 | 145 8 | 9 8 | 212 | 15.30 | 19 | 1114 |
| 64 13 16 53 | 3.05 | 10 | 613 | 1 14 | 5.80 | $145\frac{8}{8}$ | ğ | 21/21/21/21/21/21/21/21/21/21/21/21/21/2 | 15.60 | 19 | 113 % |
| 16 53 | 3,15 | 101, | 63.8 | $rac{1}{1}rac{3}{2}\ 1\frac{2}{6}$ | 6.00 | 1434 | 91_{8} | 217 | 15.90 | 1914 | 115 \$ |
| 53 64 27 32 | 3,15 | 10^{14} | 63 3 | 17/6 | 6.00 | 1434 | 91 2 | 29% | 16.20 | 1917 | 115 8 |
| 55 | 3.20 | 1012 | 65 8 | 1:49 | 6.20 | 1478 | 914 | 2/18 | 16.50 | 1913 | 117 3 |
| 73 | 3.20 | 1012 | 65 | 1 5 9 1 1 3 2 | 6.20 | 147 | 914 | 25% | 16.80 | 1913 | 1134 |
| 27 | 3.30 | 10^{5} $\frac{7}{8}$ | 63 | 1 🖁 🗓 | 6.40 | 15 | 93 % | 234 | 17.35 | 20 | 1211 |
| 38 | 3.30 | $10^{5}\mathrm{s}$ | 634 | 11/2 | 6.40 | 15 | 93 8 | 231 2116 | 17.90 | 20 | 121 |
| 54 / S. 7.4 96.19.4 / 18.4 # 12.23.4 561 / 7.6 25.56 15.7 66.35.66 | 3.40 | 1034 | 613 | 131 11/2 *1 17 *1 32 | 6.65 | 15 | | $2\frac{1}{12}$ | 18.45 | 201/2 | 1234 |
| 15/16 | 3.40 | 1037 | 61% | 194 | 6.90 | $15\frac{1}{4}$ | $\frac{93}{95}\frac{8}{8}$ | 23/4 | 19.00 | 201/2 | 125 3 |
| 81 | 3.50 | 107 | 614 | 1 1 3 2 | 7.15 | 1514 | 95 8 | 2 3 5 | 19.50 | 2012 | 125 4 |
| 31 | 3.50 | $107\mathrm{s}$ | 61_{4} | $\begin{array}{c c} 1\frac{18}{32} \\ 1^{\frac{1}{5}} \stackrel{?}{6} \end{array}$ | 7.40 | $15\frac{1}{2}$ | 974 | 235 2136 | 20.00 | $20\frac{1}{2}$ | 125 8 |
| 63 | 3.60 | ' 11 | $6^3 s$ | 1 3 4 | 7.65 | 15 $\frac{1}{2}$ | $97\frac{1}{8}$ | 234 | 20.50 | 21 | 131 8 |
| 1 | 3.60 | 11 | $\frac{6^3}{6^1}\frac{8}{2}$ | $ \begin{array}{c c} 1_{16}^{11} \\ 1_{23}^{23} \\ 1_{34}^{24} \end{array} $ | 7.90 | $15^{3}\frac{7}{4}$ | $10^{1} \pm 3$ | 27/8 22/8 215/6 | 21.00 | | 13 |
| 1_{64}^{1} | 3.70 | 1116 | $\frac{61}{2}$ | 133 | 8.15 | $153\frac{7}{4}$ | 911 ² | $2\tfrac{29}{12}$ | 22.00 | 21 | 13 |
| 1 3 2 | 3.70 | 11^{18} | $\frac{6^{1}}{2}$ | 134 | 8.40 | 16 | 915 | $2^{13}6$ | 23.00 | 21 | 13 |
| 1_{64}^{3} | 3.80 | 1114 | $\frac{65}{8}$ | 1 5 5 1 1 3 6 | 8.60 | 16 | 915 | $2\frac{1}{3}$ | 24.00 | 22 | 14 |
| 116 | 3.80 | 1114 | $-65 \pm \frac{65}{8}$ | 11316 | 8.80 | 1614 | 1013 | 3 | 25.00 | 22 | 137 § |
| -1.5_{4}^{5} | 3.90_{-} | $11\frac{1}{2}$ | $67\frac{\circ}{8}$ | 1 3 7 | 9.00 | $16\frac{7}{4}$ | 10 ¹ s | | : | •••• | |

ABOVE DRILLS HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive)inches | ¹ 2 to ⁹ 16 | 37 to 38 | 59 to 11/4 | 1 17 to 2 | $2\frac{1}{64}$ to 3 |
|-----------------------------|-----------------------------------|----------|------------|----------------------|----------------------|
| Morse Taper Shanknumber | 1 | -2 | 3 | 4 | 5 |

^{*}Drills 1_{64}^{34} inches and larger take a different discount than 11_2 inches and smaller. Drills larger than 11_2 inches are furnished in 64th sizes if ordered and take price of the next larger size listed.

MORSE FOUR-GROOVE DRILLS

No. 104H, STRAIGHT SHANK



Fig. 426A

| Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Shank Inches | Length Shank Inches | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Shank Inches | Length Shank Inches |
|--|---------------------|---------------------------------|---------------------------------|--|--|--|------------------|---------------------------------|--|-------------------------------------|---------------------------------|
| ## \ | $\frac{1.90}{1.95}$ | 73/4 8 | 5 5½ | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 2 | 135 137 | 8.60 8.80 | 16 16¼ | 117/8 121/8 | 11/4 11/4 | 3 3 3 3 3 3 3 3 |
| 32 % | 2.00 | 81/4 | $5\frac{1}{2}$ | 1/2 | $\frac{2}{2}$ | 137 | 9.00 | 1614 | 1218 | 11/ | 3 |
| 19 | 2.30 | 81/2 | 53/4 | 1,2 | 2 | $1\frac{37}{32}$ $1\frac{7}{8}$ | 9.20 | 161/2 | $12\frac{1}{8}$ $12\frac{1}{4}$ | 11/4 | 3 |
| 5/8 | 2.60 | 83/4 | $53\frac{3}{4}$ | 5/8 | 214 | 132 | 9.35 | 161/2 | 121/4 | 11/4 | 3 |
| 31 | 2.70 | 9 | 6 | 5/8 | 21/4 | 115/6 | 9.50 | 161/2 | 1214 | 11/4 | 3 |
| 2/6 | 2.75 | 914 | 614 | 28 | 214 | 133 | 9.65 | 161/2 | 1214 | 11/4 | 3 |
| 32 | $2.85 \\ 2.90$ | 91/2 | 61/2 | 3/8 | $ \begin{array}{c c} 217 \\ 217 \end{array} $ | $2 \frac{1}{2\frac{1}{32}}$ | $9.80 \\ 10.20$ | $16\frac{1}{2}$ $16\frac{1}{2}$ | $12\frac{1}{8}$ $11\frac{3}{4}$ | $1\frac{1}{4}$ $1\frac{1}{2}$ | 31/2 |
| 23 | 3.00 | 934 978 | $6\frac{3}{4}$ $6\frac{7}{8}$ | 3/4 | 214 | 216 | 10.60 | 17 | $12\frac{1}{4}$ | $1\frac{1}{2}$ | $3\frac{1}{2}$ |
| 13/2 | 3.05 | 10 | 7 8 | 34 | 214 | $2\frac{16}{3}$ | 10.90 | 17 | 1214 | 11/2 | 31/2 |
| 27 27 | 3.15 | 101/4 | 71/4 | 34 | 21/4 | 21/6 | 11.20 | 17 | 121/8 | 11/2 | 31/2 |
| 1/8 | 3.20 | 101/6 | 71/4 | 7.8 | $\begin{vmatrix} 21/2 \\ 21/2 \end{vmatrix}$ | $2\frac{5}{32}$ $2\frac{5}{16}$ $2\frac{7}{32}$ | 11.60 | 17 | 121/6 | 11/2 | 31/2 |
| 33 | 3.30 | 105% | 73% | 7/8 | $2\frac{1}{2}$ | 23/6 | 12.00 | 17 | 1218 | $1\frac{1}{2}$ | 31/2 |
| 1/2/6 | 3.40 | 1034 | 71/2 | <u>7</u> 8 | $2\frac{1}{2}$ | $2\frac{7}{32}$ | 12.40 | 171/2 | 125/8 | 11/2 | 31/2 |
| 312 | 3.50 | 107/8 | 75/8 | 1/8 | 2½ 2½ 2½ 2¾ | 21/4 | 12.80 | 171/2 | 121/2 | 11/2 | 31/2 |
| 1 | 3.60 3.70 | 111/8 | 7½ 75/8 | 1 | $\begin{vmatrix} 2\frac{7}{4} \\ 2\frac{3}{4} \end{vmatrix}$ | $2\frac{9}{32}$ $2\frac{5}{16}$ | $13.20 \\ 13.60$ | $17\frac{1}{2}$ $17\frac{1}{2}$ | $12\frac{1}{2}$ $12\frac{1}{2}$ | $\frac{1\frac{1}{2}}{1\frac{1}{2}}$ | $\frac{31\sqrt{2}}{31\sqrt{2}}$ |
| 137 | 3.80 | 111/4 | 73/4 | i | $2\frac{2}{4}$ | $2\frac{16}{11}$ | 14.00 | 18 | $\begin{vmatrix} 12/2 \\ 13 \end{vmatrix}$ | 11/2 | $\frac{372}{31/2}$ |
| 1.36 | 3.90 | 111/2 | 18 | i | 234 | 23/2 | 14.40 | 18 | 127/8 | $\frac{11/2}{11/2}$ | 31/2 |
| 11% | 4.00 | 113/ | 81/4 | ī | 234 | $2\frac{3}{8}$ $2\frac{13}{32}$ | 14.70 | 181/2 | 133% | 11/2 | 31/2 |
| 1 Å | 4.25 | $11\frac{3}{4}$ $11\frac{7}{8}$ | 83/6 | 1 | $egin{array}{c} 234 \ 234 \ \end{array}$ | 27/6 | 15.00 | 181/2 | 133% | 11.5 | 31/2 |
| 13/6 | 4.50 | 12 | 8½ 85/8 | 1 | 23/4 | 243 | 15.30 | 19 | 131/4 | 11/2 | 31/6 |
| $1\frac{7}{32}$ | 4.65 | 121/8 | 85/8 | 1 | 234 | 21/3 | 15.60 | 19 | 1334 | $11\frac{7}{2}$ | $31\frac{7}{2}$ |
| 11/4 | 4.80 | 1212 | 834 | 11/4 | 3 | $2\frac{17}{32}$ | 15.90 | 1914 | 14 | 11/2 | 31/2 |
| 137 | $5.00 \\ 5.20$ | 14½ 14¼ | 103 8 | 11/4 | 3 3 | 25/6 25/8 25/8 | $16.20 \\ 16.50$ | 1914 | 14 14!4 | 11/2 | $\frac{31\sqrt{2}}{31\sqrt{2}}$ |
| 1 11 | 5.20 5.40 | 143/4 | 105/2 | 11/4 | 3 | 232 254 | 16.80 | 191/2 | 141/8 | $1\frac{1}{2}$ | 314 |
| 13/2 | 5.60 | 1412 | 1034 | 11/4 | 3 3 | $\frac{2}{2}\frac{8}{3}$ | 17.35 | 20 | 1456 | $1\frac{1}{2}$ | $\frac{31}{2}$ $\frac{31}{2}$ |
| 113 | 5.80 | 1412 145/8 | 1078 | 114 | 3 | 211/6 | 17.90 | 20 | $14\frac{5}{8}$ $14\frac{5}{8}$ | 11/2 | 31/6 |
| 1% | 6.00 | 143/ | 111 | 11/4 | 3 | 243 | 18.45 | 201/2 | $15\frac{1}{8}$ | 11/6 | $\frac{312}{312}$ |
| $1\frac{1}{3\frac{5}{2}}$ | 6.20 | 147/8 | 111/8 | 11/4 | 3 | 234 235 235 | 19.00 | 201/2 | 15 | $11\frac{7}{2}$ | $3\frac{1}{2}$ |
| 11/2 | 6.40 | 15 | 1114 | 11/4 | 3 | $ 2\frac{25}{32}$ | 19.50 | 201/2 | 141/2 | 134 | 4 |
| *1 17 | 6.65 | 15 | 111/4 | 11/4 | 3 | 2137 | 20.00 | 201/2 | 141/2 | $\frac{137}{4}$ | 4 |
| 11/6 | 6.90 7.15 | 15½ 15¼ | 111/2 | 11/4 | 0 | $egin{array}{c} 2rac{27}{32} \ 2rac{7}{8} \end{array}$ | $20.50 \\ 21.00$ | 21 21 | 15 147/ ₈ | $\frac{13/4}{13/4}$ | 4 |
| 1 3 2 1 5 2 | 7.40 | 151/4 | $11\frac{1}{2}$ $11\frac{3}{4}$ | 114 | 3 | 2 1/8 2 2/9 2 3/2 | 22.00 | 21 | 1478 | 13/4 | 4 4 4 |
| 11111111111111111111111111111111111111 | 7.65 | 151/5 | 1134 | 11/4 | 3 3 3 3 3 3 3 3 3 3 3 3 3 | 256 | 23.00 | 21 | 14% | 137 | 4 |
| 1112 | 7.90 | 1534 | 12 | 114 | 3 | 2312 | 24.00 | 22 | 15% | 134 | $ar{4}$ |
| 133 | 8.15 | 153/4 | 12 | 11/4 | 3 | 3 2 | 25.00 | 22 | 1534 | 134 | 4 |
| 13/4 | 8.40 | 16 | 117/8 | 11/4 | 3 | | | | | | |

^{*}Drills 133-inch and larger take a different discount than 1½-inch and smaller.

MORSE PATENT CONSTANT ANGLE TWIST DRILLS

WITH HOLES THROUGH SOLID METAL FOR LUBRICANT No. 102A, MORSE TAPER SHANK



No. 102B MORSE TAPER SHANK



Fig. 681B No. 102C MORSE TAPER SHANK



| Dia. | 001 |
|------|-----|

| Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches No. 102A | Twist Cut Inches Nos. 102 B. & C. | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches No. 102A | Twist Cut Inches Nos. 102 B. & C. | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches No. 102A | Twist Cut Inches Nos. 102 B. & C. |
|---|--|---|--|---|---------------------------------------|--|---|---|---|--|--|--|--|---|
| (80 cts \ 60 cts \ \ 20 cts \ \ 60 cts \ \ 60 cts \ \ 60 cts \ \ \ 60 cts \ 60 cts \ \ 60 cts \ \ 60 cts \ 60 cts \ \ 60 cts \ 60 cts \ \ 60 cts \ | 3.00 3.15 3.30 3.85 4.00 4.15 4.30 4.70 4.80 4.95 5.20 5.35 5.50 5.70 6.05 | 63/4 71/4/71/4/71/4/71/4/2 73/4 81/4/8/3/4 91/4/91/4/91/4/10/10/10/10/10/10/10/10/10/10/10/10/10/ | 35 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 374 4 4 4 4 5 5 5 5 5 6 6 6 5 5 3 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 7.10 7.45 7.80 8.00 8.20 8.40 9.40 10.15 10.95 11.80 12.30 | 1034 1078 11118 11118 11118 11178 1218 1218 121 | 61/4 8 8 8 18 4 18 8 18 8 18 18 18 18 18 18 18 18 18 18 | 61448 2 8 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 | 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 14.00 14.20 14.40 15.00 15.35 15.70 16.10 16.50 16.75 17.00 17.25 17.50 17.85 18.20 18.60 19.00 | 15 15 15 15 15 15 15 15 15 16 16 16 16 16 16 16 16 16 16 16 16 16 | 91/2 91/2 93/4 95/6 91/6 93/4 10 10 97/8 97/8 | 93 8 93 8 95 8 95 8 97 8 97 8 91 6 101 8 103 8 103 8 104 4 101 4 |

*These drills 13 and smaller are furnished with one oil hole only. They can be furnished with two if ordered, but at customer's risk.

ABOVE DRILLS HAVE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive)inches | 3 to 18 | 37 to 38 | 29 to 11. | 147 to 2 |
|-----------------------------|---------|----------|-----------|----------|
| | | 64 532 | 01 | |
| Morse Taper Shanknumber | 1 | Z | 3 | 42 |

These drills have holes through the solid metal and have great advantages over any other drill devised for conveying the lubricants as well as air to the point. Air is sometimes used for blowing out the chips and keeping the drill cool.

Drills are furnished in 64th sizes and take price of the next larger size listed.

MORSE PATENT CONSTANT ANGLE TWIST DRILLS

WITH HOLES THROUGH SOLID METAL FOR LUBRICANT
No. 104A STRAIGHT SHANK



No. 104B STRAIGHT SHANK



Fig. 424B

These drills have holes through the solid metal and have great advantages over any other drill devised for conveying the lubricant as well as air to the point. Air is sometimes used for blowing out the chips and keeping the drill cool.

Drills are furnished in 64th sizes and take price of the next larger size listed.

| Diam. | Price | Length | Twist Cu | t, Inches | Diam. | Price | Length | Twist Cu | т, Ілснев |
|-----------------|-------|--------------------|-------------------------------|----------------|-----------------|-------|--------------------|-----------------|-----------|
| Inches | Each | Over All Inches | No. 104A | No. 104B | Inches | Each | Over All Inches | No. 104A | No. 104B |
| 3/8 13 32 | 3.00 | 63/4 | 41/4 | 414 | 1 32 | 8.40 | 121/4 | 81/8 | 81/8 |
| 13 | 3.15 | 7 | 43.8^{7} | 43 8 | 11/4 | 8.70 | $12\frac{1}{2}$ | 81/2 | 81/2 |
| 7/6 | 3.30 | 7!4 | 45% | 45/8 | $1\frac{9}{32}$ | 9.40 | 141/8 | 91/8 | 91/8 |
| | 3.85 | 71/2 | 478 | 47/8 | 15/6 | 10.15 | 1414 | 91/4 | 91/4 |
| 1/2 | 4.00 | $7\frac{3}{4}$ | 5 | 5 | 1 3 3 | 10.95 | $143\frac{7}{8}$ | 93% | 93/8 |
| $\frac{17}{32}$ | 4.15 | 8 | 514 | 51/4 | 13% | 11.80 | 141/2 | 91/2 | 91/2 |
| % 6 | 4.30 | 814 | $53\frac{2}{8}$ | 5^3 8 | 1 1 3 2 | 12.30 | $145\frac{7}{8}$ | $9\frac{1}{2}$ | 91/2 |
| 32 | 4.50 | 81/2 | $55\frac{2}{8}$ | 55/8 | 17/6 | 12.85 | 1434 | 95/8 | 95/8 |
| 5/8 | 4.70 | 83/4 | $5\frac{3}{4}$ | $5\frac{3}{4}$ | 1 12 | 13.35 | 147/8 | 934 | 93/4 |
| $\frac{21}{32}$ | 4.80 | 9 | 57% | 57/8 | 11/2 | 14.00 | 15 | 97/8 | 97/8 |
| 11/6 | 4.95 | 914 | 6 | 6 | $1\frac{1}{32}$ | 14.20 | 15 | 91/8 | 91/2 |
| 33 | 5.10 | 91/2 | 63/6 | 63/16 | 1% | 14.40 | $15\frac{1}{4}$ | 93 8 | 93/4 |
| 3/4 | 5.20 | 934 | 638 | 63 s | 1 1 3 2 | 14.70 | $15\frac{1}{4}$ | 93 8 | 93/4 |
| 13 | 5.35 | 978 | $6^{1}\sqrt{2}$ | 61/2 | 156 | 15.00 | $15\frac{1}{2}$ | 95/8 | 10 |
| 13/16 | 5.50 | 10 | 6^{5} $\stackrel{?}{8}$ | 65/8 | 1 3 1 | 15.35 | $15\frac{1}{2}$ | 95/8 | 10 |
| 33 | 5.70 | 1014 | 63/4 | 63/4 | 1"16 | 15.70 | 1534 | 978 | 1014 |
| 28 | 5.90 | 101/2 | 7 | 7 | 133 | 16.10 | 15^{3} | 978 | 101/4 |
| 32 | 6.05 | 105/8 | 7 | 7 | 134 | 16.50 | 16 | 101/8 | 101/2 |
| 2)6 | 6.20 | 1034 | 7 | 7. | 133 | 16.75 | 16 | 101/8 | 101/2 |
| 31 | 6.35 | 107/8 | 71/8 | 71.8 | 113/6 | 17.00 | $16^{1}4$ | 103 8 | 103/4 |
| 1. | 6.50 | 11 | 7816 | 73/16 | 123 178 | 17.25 | | 103 | 103/4 |
| 1 3/2 | 6.80 | 111/8 | 7516 | 75/6 | 1/8 | 17.50 | | 105/8 | 11 |
| 116 | 7.10 | 111/4 | 73 8 | 73.8 | 132 | 17.85 | $16\frac{1}{2}$ | $10\frac{5}{8}$ | 11 |
| $1\frac{3}{32}$ | 7.45 | 111/2 | 1 ³ / ₈ | 75/8 | 1136 | 18.20 | 161/2 | 105/8 | 11 |
| 11/8 | 7.80 | 1134 | 778 | $7\frac{7}{8}$ | 131 | 18.60 | | 105/8 | 11 |
| 1 32 | 8.00 | 117/8 | 8 | 8 | Z | 19.00 | $16\frac{1}{2}$ | 105/8 | 11 |
| 1 % | 8.20 | 12 | 81/8 | 81/8 | 11 | l | | | ٠ |

^{*}These drills \(\frac{15}{3}\)-inch and smaller are furnished with one oil hole only. They can be furnished with two if ordered, but at customer's risk.

MORSE

PATENT CONSTANT ANGLE TWIST DRILLS

WITH HOLES THROUGH SOLID METAL FOR LUBRICANT

No. 104D. STRAIGHT SHANK



Fig. 6279A

| - | PR | ICE EA | CH | T | WIST C INCHES | t'T | i | | Pı | rice Ea | сн . | Twist Cut Inches | | |
|---------------------------------------|--|--|--|---|---|--|---------------------------------------|--|--|--|--|--|--|---|
| Diameter inches | Whole Length 8!, Inches | Whole Length 1019 Inches | Whole Length 13 Inches | Whole Length 8!4 Inches | Whole Length 10'2 Inches | Whole Length 13 Inches | Diame Inche | | Whole Length 8½ Inches | Whole Length 10% Inches | Whole Length 13 Inches | Whole Length 8½ Inches | Whole Length 10% Inches | Whole Length 13 Inches |
| 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 4.60 4.70 4.70 4.70 4.70 4.80 4.80 5.00 5.00 5.10 5.30 5.40 5.50 6.00 6.10 6.30 6.50 6.70 6.80 | 5.30 5.40 5.40 5.40 5.40 5.40 5.50 5.60 5.80 5.90 6.10 6.20 6.30 6.50 7.20 7.40 7.60 7.90 | 5.90 6.00 6.00 6.10 6.10 6.20 6.30 6.30 6.40 6.50 7.00 7.10 7.20 7.40 7.70 8.10 8.30 8.60 8.80 | \$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 | 914 914 914 914 914 914 914 914 914 914 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 14776512442 1692 X 842 1692 X 2518 1672 X 2515 342 1642 X 842 7.10 7.40 7.70 8.00 8.60 8.90 9.20 9.60 9.80 10.20 10.30 10.40 10.50 11.00 11.00 11.00 11.00 11.00 11.00 | 8.30 8.60 9.00 9.30 9.90 10.30 10.70 11.00 11.20 11.60 11.80 12.20 12.20 12.50 12.70 12.90 13.10 13.30 13.30 | 9.30 9.60 10.00 10.70 11.20 11.50 12.10 12.20 12.40 12.50 12.50 13.00 13.40 13.70 14.00 14.20 14.40 14.60 | 55555555544444444444444444444444444444 | 66666666666666666666666666666666666666 | 999999999888888888888888888888888888888 |

Drills 133 to 2 inches diameter, $8\frac{1}{2}$ inches long, have shanks $1\frac{1}{2}$ inches diameter, 3 inches long.

Drills 1_{64}^{124} to 2 inches diameter, $10\frac{1}{2}$ inches long, have shanks $1\frac{1}{2}$ inches diameter, $3\frac{1}{4}$ inches long.

Drills 131 to 2 inches diameter, 13 inches long, have shanks 11/2 inches diameter, 31/2 inches long

MORSE PATENT CONSTANT ANGLE TWIST DRILLS

No. 104E, STRAIGHT SHANK OIL DRILLS



Fig. 6280A

| | Pi | RICE EA | CH | | P | RICE EA | СН | 1 | P | BICE EA | СН |
|-------------------|--------|-----------|----------|---------------------------------|--------|------------|----------|-----------|--------|-----------|----------|
| Diameter | Length | Over Al | l.Inches | Diameter | Length | Over All | , Inches | Diameter | Length | Over All | . Inches |
| Inches | 84 | 101/2 | 13 | Inches | 814 | 1012 | 13 | Inches | 81, | 1012 | 13 |
| | Twis | t Cut, lr | iches | ì | Twi | st Cut. Ii | nches | 1 | Twis | t Cut, Ir | ches |
| | 412 | 61/2 | 9 | | 412 | 1 612 | 9 | | 412 | 612 | 9 |
| 81 1/2 | 5.80 | 6.80 | 7.80 | $1\frac{1}{64}$ $1\frac{1}{32}$ | 6.10 | 7.00 | 8.00 | 135 1% | 9.90 | 11.20 | 12.50 |
| 84 37 | 5.80 | 6.80 | 7.80 | 16 116 | 6.20 | 7.10 | 8.20 | 137 138 | 10.10 | 11.40 | 12.60 |
| 35 % | 5.80 | 6.70 | 7.70 | 164 132 | 6.30 | 7.20 | 8.40 | 134 158 | 10.40 | 11.60 | 12.80 |
| 47 19 47 19 | 5.70 | 6.70 | 7.70 | 164 11/8 | 6.40 | 7.40 | 8.50 | 181 131 | 10.50 | 11.80 | 13.00 |
| 39 5 8 | 5.70 | 6.70 | 7.60 | $1\frac{9}{64}$ $1\frac{5}{32}$ | 6.50 | 7.50 | 8.60 | 1 43 1116 | 10.60 | 12.00 | 13.20 |
| 64 31 | 5.70 | 6.60 | 7.60 | 164 1% | 6.60 | 7.60 | 8.80 | 1# 1# | 10.80 | 12.10 | 13.40 |
| 43 K | 5.60 | 6.60 | 7.50 | 113 13 | 6.70 | 7.80 | 8.90 | 147 134 | 11.00 | 12.30 | 13.50 |
| 85 33 | 5.60 | 6.50 | 7.50 | 111 114 | 6.80 | 7.90 | 9.00 | | 11.20 | 12.50 | 13.70 |
| 87 34 | 5.60 | 6.50 | 7.40 | 147 135 | 7.10 | 8.40 | 9.40 | 184 136 | 11.40 | 12.70 | 13.90 |
| 83 13 | 5.70 | 6.60 | 7.40 | 119 156 | 7.50 | 8.70 | 9.80 | | 11.60 | 12.90 | 14.00 |
| 81 B6 | 5.70 | 6.60 | 7.50 | 181 141 | 7.80 | 9.20 | 10.20 | 184 176 | 11.80 | 13.00 | 14.20 |
| 89 37 | 5.80 | 6.70 | 7.50 | 123 138 | 8.20 | 9.60 | | 187 138 | 12.00 | 13.20 | 14.40 |
| 81 7/8 | 5.80 | 6.70 | 7.60 | 183 133 | 8.60 | 9.90 | 11.00 | 189 156 | 12.20 | 13.40 | 14.60 |
| 27 32 | 5.90 | 6.80 | 7.60 | 187 176 | 9.00 | 10.20 | 11.40 | 181 131 | 12.40 | 13.60 | 14.80 |
| 84 1X6 | 5.90 | 6.80 | 7.70 | 189 133 | 9.20 | 10.50 | 11.80 | 183 2 | 12.60 | 13.80 | 15.00 |
| 81 31 | 6.00 | 6.90 | 7.80 | 134 11/2 | 9.50 | 10.80 | 12.20 | | | | |
| ķ} 1 | 6.00 | 6.90 | 7.90 | 133 143 | 9.70 | 11.00 | 12.30 | | ١ | | |

Above drills have shanks 114 inches diameter, 3 inches long.

No. 114D, MORSE HOLLOW DRILLS



Fig. 6280B

| Diam. Inches | Price Each | Length Over All Inches | Size of Hole Inches | Diam. Inches | Price Each | Length Over All Inches | Size of Hole Inches | Diam. Inches | Price Each | Length Over All Inches | Size of Hole Inches |
|-----------------|---------------|------------------------------|---------------------------|-----------------|---------------|------------------------------|---------------------------|-----------------|---------------|------------------------------|---------------------------|
| 3/8 | 3,20 | 6 | 3 8 | 176 | 5.40 | $\frac{71/_{2}}{}$ | 7.6 | $2^{1}i$ | 10.00 | 10 | 1^3 s |
| 11,2 | 3.40 | 6 | 3 | 11/2 | 5.80 | 8 - | 15/6 | 2^{5} | 10.40 | 10 | 13 8 |
| 3/4 | 3.60 | 6 | 7/6 | 1916 | 6.10 | 8 | 15 | 23 8 | 10,80 | 10 | 13 8 |
| 13/ | 3.70 | $6\frac{1}{2}$ | 7/6 | $15\frac{7}{8}$ | 6.40 | 8 | 1 | 27/6 | 11.20 | 10 | 13_{8} |
| 7 ∕8 | 3.80 | $61\frac{7}{2}$ | 1/2 | 1^{11}_{16} | 6.70 | 8 | 1 | 21/2 | 11.60 | 10 | 13, |
| 13/6 | 3.90 | $6\frac{1}{2}$ | 1/2 | $1\frac{3}{4}$ | 7.20 | 9 | 118 | 2976 | 12.00 | 12 | 11/2 |
| 1 | 4.20 | 7 | 976 | 1^{13}_{16} | 7.60 | 9 | 118 | 25% | 12.40 | 12 | 11/2 |
| 116 | 4.30 | 7 | 916 | 17% | 8.00 | 9 | 11_8 | 2116 | 12.80 | 12 | 11/2 |
| 118 | 4.40 | . 7 | 5 % | 1116 | 8.40 | 9 | 118 | 234 | 13.20 | 12 | 11/2 |
| 13/6 | 4.50 | 7 | 11/16 | 2 | 8.80 | 1 9 | 118 | 2136 | 13.60 | 12 | 113 |
| 11, | 4.80 | 71/2 | 34 | 216 | 9.10 | 10 | 114 | $ 27\pm $ | 14.00 | 12 | 11/2 |
| 15% | 5.00 | $7\frac{1}{2}$ | 13 | 21% | 9.40 | 10 | 114 | 2^{15} | 14.50 | 12 | $11\frac{7}{2}$ |
| 13 % | 5.20 | $71\frac{7}{2}$ | 78 | 2^{3}_{16} | 9.70 | 10 | $+11_{4-1}$ | 3 ~ | 15.00 | 12 | $1\sqrt{2}$ |

The above drills have a hole lengthwise through the shank connecting with the grooves of the drill. The shank can be threaded and fitted to a metal tube of such lengths as desired.

NOVO HIGH SPEED STEEL FLAT TWISTED DRILLS

MORSE TAPER SHANK



| | ·: | | | | | | |
|--|-------|----------------------|-------------------------------------|--|---------------|--------------------|---------------------|
| Diameter | Price | Length Over All | Length Twisted | Diameter | Price | Length Over All | Length Twisted |
| Inches | Each | Inches | Inches | Inches | Each | Inches | Inches |
| 3 8 | 1.00 | 634 | | $1\frac{15}{32}$ | 10.00 | 153/4 | 91/2 |
| 13 | 1.10 | 7.1 | $\frac{3\frac{1}{2}}{3\frac{3}{4}}$ | 11. | 10.40 | 1734 | 934 |
| 32 7/ | 1.15 | 717 | 4 | 117 | 10.80 | 1734 | 93, |
| 132 7 16 152 32 | 1.20 | -10^{10} | 45/6 | $1\frac{1}{2}$ $1\frac{17}{3}$ $1\frac{3}{16}$ | 11.20 | 18 | 10 |
| | 1.30 | 9 2 | 47% | 1 | 11.65 | 18 | 10 |
| 17 | 1.40 | 91/4 | 512 | 1^{32}_{8} | 12.10 | 1814 | 1014 |
| 2772 139 169 137 18 | 1.50 | 912 | 533 | | 12.60 | 1814 | 1014 |
| 18 | 1.60 | $91\frac{2}{2}$ | 53% | $\frac{1\frac{21}{4}}{1^{11}_{16}}$ | 13.05 | 181% | 101/2 |
| 5% | 1.75 | 10 2 | 57% | 133 | 13.60 | 1813 | 101. |
| | 1.90 | 10 | 573 | 132 | 14.10 | 1834 | 103 |
| 21 32 11/ 16 23 32 34 | 2.05 | 1017 | 61/8 | 135 | 14.55 | 1834 | 1034 |
| 23 | 2.25 | 1014 | 61 % | 113/6 | 15,00 | 19 | 11 |
| 3/4 | 2.40 | 101 | 6^3 $\overset{\circ}{\downarrow}$ | 1 27 | 15.50 | 19 | ii |
| 25 | 2.60 | 101.5 | 63 3 | 137 178 | 16.00 | 1914 | 1114 |
| 25 32 137 16 | 2.80 | 11^{1} $\tilde{5}$ | 65% | 1 38 | 16.55 | 1914 | 111_{4}^{7} |
| 21X | 3.00 | $11^{1\frac{7}{2}}$ | 65 % | 138 1156 | 17.10 | 1913 | 111/2 |
| 7Z | 3.20 | $11\frac{3}{4}$ | 67% | 1310 | 17.65 | 1913 | 1115 |
| 28 | 3.45 | $113\frac{7}{4}$ | 67.8 | 232 | 18.20 | $195\frac{2}{8}$ | 115 🖁 |
| 772/39 772/39 7737 7739 7737 1516 | 3,75 | 12 | 713 | $\bar{2}_{1_{16}}$ | 19.50 | 1937 | $11\frac{3}{4}$ |
| 32 | 4.05 | 12 | 71% | 21/8 | 20.80 | 1978 | 1177 |
| 1 32 | 4.35 | 121/4 | 73 8 | 2^{3}_{16} | 22.20 | 20 ° | 12 |
| 1 🛵 | 4.75 | $12^{\frac{1}{4}}$ | 73% | $2^{\frac{10}{4}}$ | 23 ,60 | 20 | 12 |
| $\frac{1_{32}}{1_{16}}$ | 5.10 | $12\frac{1}{3}$ | † 75 š | 257 | 25.00 | 2017 | 1214 |
| 1 35 | 5.45 | $12^{1}\frac{1}{2}$ | 75 % | $2^3\frac{9}{8}$ | 26.40 | 2016 | 121 |
| 117 | 5.80 | 14 | 734 | 27_{16} | 27.80 | 2034 | $123	ilde{4}$ |
| 1 5 | 6.20 | 14 | 734 | 21.6 | 29.20 | 21 | $12^{3}\frac{7}{4}$ |
| $\frac{1}{13} \frac{5}{13} \frac{1}{16}$ | 6,55 | $14 \pm \frac{1}{2}$ | 814 | 297 | 30.60 | $211\frac{1}{2}$ | 1314 |
| 1_{32}^{7} | 6.90 | 14^{\pm} | 814 | $2^{5\frac{7}{8}}$ | 32.00 | 22 | 1334 |
| $1^{\frac{1}{4}}$ | 7.20 | 15 | 834 | 211/16 | 34.00 | 221_{2} | 1414 |
| 1 32 | 7.60 | 15 | 834 | 2^3 | 36.00 | 23 | $14\frac{34}{4}$ |
| 156 | 8.00 | 151_4 | 9 | 213 6 | 38.00 | 231_{2} | $15\frac{1}{4}$ |
| 1 11 | 8.40 | 15^{1}_{4} | 9 | 27 4 | 40.00 | 24 | 1534 |
| $1^{3} \frac{1}{8}$ | 8.80 | $15\frac{1}{2}$ | 914 | $\frac{2^{15}}{3}^{16}$ | 42.50 | $24\frac{1}{2}$ | 1614 |
| $\frac{1}{1}\frac{13}{7}$ $\frac{1}{7}$ | 9.20 | 15^{+}_{2} | 914 | 3 | 45.00 | 25 | 16^{3}_{4} |
| 17/6 | 9.60 | $15^{3}4_{}$ | 91 2 | | | | |

ABOVE DRILLS HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameter (inclusive)inches | $ ^3 \times to \frac{15}{32} $ | 1 g to 33 | $^{13}_{16}$ to $1\frac{3}{12}$ | 1½to 1持 | 115 to 3 |
|----------------------------|--------------------------------|-----------|---------------------------------|---------|----------|
| Morse Taper Shanksnumber | 1 | -2 | 3 | 4 | 5 |

These drills are made out of flat bar steel twisted; then fitted into a tool steel shank. Can be furnished straight or taper shank.

Drills furnished in regular standard taper shank drill length.

MORSE SHELL DRILLS

No. 102H ANGLE OF SPIRAL 15°



Pig. 520A

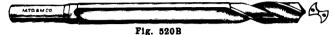
| Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Size Hole Inches | Diameter Inches | Price Fach | Length Over All Inches | Length of Flutes Inches | Size Hole Inches | Diameter Inches | Price Each | Length Over All Inches | Lengthof Flutes Inches | Size Hole Inches |
|--|--|--|--|--|---|---|---|---|--|---|---|---|--|--|
| 111 16 134 113 16 17 8 115 16 2 16 2 16 2 16 | 3.80 4.10 4.40 4.70 5.00 5.20 5.40 5.60 | 31/2 31/2 31/2 31/2 31/2 31/2 33/4 33/4 33/4 33/4 | 23/4 23/4 23/4 23/4 23/4 23/4 3 3 | 1 1 1 1 1 1 1 ¹ / ₄ | 213/6 27/8 215/6 31/8 31/8 31/4 | 8.40 8.80 9.20 9.60 9.90 10.20 10.60 11.00 | 4 4 4 4 4 ¹ / ₂ 4 ¹ / ₂ 4 ¹ / ₂ | 14/4/4/4/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8 | 1½ 1½ 1½ 1½ 1½ 1¾ 1¾ 1¾ 1¾ 1¾ | 315/16 4 41/16 41/8 43/16 41/4 45/16 43/8 | 17.00 18.00 18.30 18.60 19.00 19.40 19.80 20.20 | 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 | 4 4 43/8 43/8 43/8 43/8 43/8 | 2 2 21/4 21/4 21/4 21/4 21/4 21/4 |
| 21.4 25.6 21.4 25.6 27.6 21.2 29.6 25.8 21.6 | 5.80 6.00 6.20 6.40 6.60 6.80 7.00 7.30 7.60 | 33/4 33/4 33/4 33/4 33/4 4 4 4 |) 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | 11/4 11/4 11/4 11/4 11/4 11/2 11/2 11/2 | 35/16 33/8 37/16 31/2 39/16 35/8 31/16 33/4 31/16 | 11.50 12.00 12.50 13.00 13.50 14.00 14.50 15.00 15.50 | 41/2 41/2 41/2 41/2 41/2 5 5 5 5 | 35.8 35.8 35.8 4 4 4 4 4 | 134 134 134 134 2 2 2 2 2 | 47.6 41.2 49.6 45.8 411.6 43.4 413.6 47.8 415.6 | 20.60 21.00 21.60 22.20 22.80 23.40 24.00 24.60 25.20 | 51/2 51/2 6 6 6 6 6 6 | 43.8 43.8 43.8 43.4 43.4 43.4 43.4 43.4 | 2\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ |

Shell Drills 1% inches to and including 3% inches have four flutes; 3% inches to and including 5 inches have six flutes.

Shell Drills take the same arbors as regular Shell Reamers.

SPECIAL LENGTH OIL DRILLS

No. 104C, STRAIGHT SHANK



No. 102D, TAPER SHANK

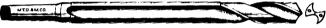


Fig. 520C

These cuts are a reproduction on a small scale of drills which were actually made and used with eminent satisfaction, the proportion of the cuts to the drills being correct. The actual dimensions of the drills were, diameter $3\frac{1}{2}$ inches, whole length 52 inches, length of shank $8\frac{5}{6}$ inches.

Special drills made to order. Price on application.



MORSE JOBBERS' REAMERS

No. 115, STRAIGHT SHANKS



Fig. 6270A No. 115B, SPIRAL FLUTES



Fig. 6270B No. 115C, THREADED ENDS



Fig. 62700 NUMBERS 115, 115B, AND 115C REAMERS

| _ | | | | | | , | | ' | | _ :== | | | | <u>·</u> |
|--|--|---|--|---|--|--|---|---|--|--|--|--|--|---|
| Diameter Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diameter Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diameter Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diameter Inches | Price Each | Length Over All Inches Length Flutes Ixches |
| \8 52\8 72\4 72\6 73\7 72\8 72\8 72\8 72\8 72\8 72\8 72\8 72 | 1.00 1.10 1.20 1.30 1.45 1.55 1.60 1.75 1.85 1.95 2.00 | 3 314 312 334 4 414 412 434 5 514 514 6 614 | 1½ 15% 13¼ 178 21% 21¼ 23% 21¼ 23% 21¼ 25% 23¼ 278 31% 31% | 3/4552 k6752 8922 15/6 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 2.60 2.70 2.80 2.95 3.10 3.25 3.70 3.85 4.00 4.15 4.30 4.45 | 83 8 83 4 91 8 93 4 10 101 4 105 \$ 107 8 111 4 111 5 8 117 8 117 8 | 43/6 43/8 49/6 411/6 47/8 55/6 55/6 55/8 55/8 55/8 55/8 55/8 55 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 5.60 5.80 6.00 6.20 6.40 6.60 6.60 7.20 7.40 7.60 7.80 8.20 8.20 8.40 | 125/8 125/8 127/8 127/8 13 13 13 13 13 13 13 13 13 13 13 13 13 | 65/66 67/66 67/66 67/66 61/2 61/2 61/2 61/2 63/4 63/4 63/4 63/4 | 2 1/6 2 1/8 6 2 1/4 6 2 1/2 2 1/8 6 2 1/4 6 2 1/2 2 1/8 6 2 1/4 6 2 1/4 6 2 1/4 6 1/ | 9.60 10.00 10.40 10.80 11.30 12.30 12.80 13.40 14.60 15.40 16.20 17.00 17.80 | 14 7 1412 714 1412 714 1412 714 15 712 15 712 15 712 15 734 1512 734 1512 734 1512 734 16 8 |
| 1602 55 251 1632 1632 1632 | 2.10 2.20 2.30 2.40 2.50 | $ \begin{vmatrix} 6\frac{1}{2} \\ 6\frac{3}{4} \\ 7 \\ 7\frac{3}{8} \\ 8\frac{1}{8} \end{vmatrix} $ | 33 8 31 2 31 6 37 8 4 1 16 | $egin{array}{c} 13_{16} \\ 13_{17} \\ 11_{4} \\ 13_{2} \\ 15_{16} \\ 13_{2} \\ 13_{2} \\ \end{array}$ | 4.75 4.90 5.05 5.20 5.40 | $\begin{array}{c c} 12 \\ 12^{1} & \\ 12^{1} & \\ 12^{3} & \\ 12^{1} & \\ 12^{1} & \\ 12^{1} & \\ \end{array}$ | 616 618 636 614 614 | $\begin{array}{c} 1^{13}_{16} \\ 1^{25}_{17} \\ 1^{25}_{15} \\ 1^{25}_{15} \\ 1^{15}_{16} \\ 1^{35}_{12} \end{array}$ | 8.60 8.80 9.00 9.20 9.40 | $ \begin{vmatrix} 13\frac{1}{2} \\ 13\frac{1}{2} \\ 14 \\ 14 \\ 14 \\ 14 \end{vmatrix} $ | $ \begin{bmatrix} 6^3 4 \\ 6^3 4 \\ 7 \\ 7 \\ 7 \\ 7 $ | 2 ¹⁵ / ₈ 3 | 18.60 19.40 | 16 8 16 8 |

Above reamers can be furnished in 64th sizes, at price of next larger size.

| | Description | | | | | | | | | | |
|------|-------------|----|-----|------|-----|-----------|----|---------------|--------|--|--|
| Set, | 1, | to | 1 | inch | in | diameter, | by | 16ths per set | 30.00 | | |
| " | 1/4 | | | 44 | 44 | ** | | 16ths | 48.00 | | |
| 66 | 17 | " | 113 | 46 | " | 64 | | 16ths | 70.00 | | |
| 46 | 17 | " | 2 ~ | ** | 64 | 44 | | 16ths | 135.00 | | |
| " | 17 | " | 1 | 44 | ** | 44 | ** | 32ds " | 57.50 | | |
| 46 | î; | 66 | 117 | 44 | • 4 | 66 | | 32ds" | 92.00 | | |
| " | 17 | " | 113 | ** | •• | .6 | | 32ds | 137.00 | | |
| " | 17 | " | 2 4 | 44 | ** | 66 | 44 | 32ds" | 265.00 | | |

MORSE REAMERS No. 115A, TAPER SHANK JOBBERS' REAMERS



| F1g. 6268A | | | | | | | | | | | | |
|--|---------------|------------------------------|----------------------------|-------------------------------|---------------|---------------------------------|----------------------------|-----------------|---------------|--------------------|----------------------------|--|
| Djam. Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diam. Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diam. Inches | Price Each | Over All Inches | Length Flutes Inches | |
| !1 | 1.50 | 58/6 | $\overline{2}$ | $1\frac{1}{32}$ | 3.95 | 1011/6 | 596 | 113/6 | 8.40 | 1411/6 | 63/4 | |
| 97 | 1.55 | 55% | 21/8 | 1 16 | 4.10 | 10 ¹³ / ₆ | 55 🐒 | 137 | 8.60 | 14116 | $6\frac{3}{4}$ | |
| 5/6 | 1.60 | 51/2 | 214 | $1\frac{3}{37}$ | 4.25 | 10% | 53/4 | 1:8 | 8.80 | 15 | 7 | |
| Ţij. | 1.65 | 55/8 | 23/8 | 11/8 | 4.40 | 11 են | 5136 | 1 32 | 9.00 | 15 | 7 | |
| 3 2 | 1.70 | 513/6 | 21/2 | $1\frac{5}{32}$ | 4.55 | 113% | 5 i i | 1136 | 9.20 | 15 | 7 | |
| 13 | 1.80 | 513/4 | 25% | 13/6 | 4.70 | 115% | 6 | 131 | 9.40 | 15 | 7 | |
| 7 <u>/</u> 4 | 1.85 | 618 | 234 | $1\frac{j}{32}$ | 4.85 | 113 4 | 61/6 | 2 | 9.60 | 15 | 7 | |
| 48 | 1.95 | 61/4 | 27 8 | 14 | 5.00 | 121/2 | 61 8 63 6 | 216 | 10.00 | 151/2 | 714 | |
| i', | 2.00 | 67/6 | 3 | 1.2 | 5.15 | 1297 | 63/6 | 21 8 | 10.40 | 151/2 | 7!4 | |
| 47 | 2.10 | 6% | 31/8 | 156 | 5.30 | 12% | 614 | 23/6 | 10.80 | 151% | 714 | |
| % | 2.15 | 63/4 | 314 | $1\frac{1}{32}$ | 5.50 | 1211/6 | 614 | 214 | 11.30 | 151/2 | 714 | |
| 18 | 2.25 | 67/8 | 33 8 | 13 8 | 5.70 | 12186 | 65/6 | 256 | 11.80 | 16 | 71/2 | |
| 5,8 | 2.30 | 79% | 31/2 | 143 | 5.90 | 12136 | 656 | 23 3 | 12.30 | 16 | 71/2 | |
| 31 | 2.40 | 73/4 | 3Ա, | 176 | 6.10 | 13 | 67/6 | 276 | i12.80 | 16 | 71/2 | |
| IIZ | 2.50 | 8 | 37/8 | 143 | 6.30 | 13 | $6\frac{7}{6}$ | 21/2 | 13.40 | 16 | 71/2 | |
| 43 | 2.60 | 83/6 | 416 | 11/3 | 6.50 | 131/8 | 61/2 | 2% | 14.00 | 161/2 | 73/4 | |
| 3/4 | 2.70 | 83% | 436 | $1\frac{1}{2}$ $1\frac{1}{3}$ | 6.70 | 1314 | 61, | 25% | 14.60 | 161/2 | 734 | |
| 25 | 2.80 | 896 | 43 8 | 1% | 6.90 | 131/8 | $6\frac{1}{2}$ | 211/6 | 15.40 | 161/2 | 73/4 | |
| 13% | 2.90 | 813/6 | 496 | 1 1 1 2 | 7.10 | 131/8 | 61/2 | 234 | 16.20 | 161/2 | 73/4 | |
| 47 | 3.05 | 815/6 | 411/6 | 15% | 7.30 | 131/8 | 61/2 | 2136 | 17.00 | 17 | 8 | |
| 7.8 | 3.20 | 93/6 | 47/8 | 135 | 7.50 | 1316 | 61/2 | 2^7 s | 17.80 | 17 | 8 | |
| 33 | 3.35 | 95% | 5 | 1^{11} 6 | 7.70 | 1374 | 634 | 2^{13}_{6} | 18.60 | 17 | 8 | |
| And Andrews Andrew | 3.50 | 10% | 518 | 133 | 7.85 | 1376 | 63.4 | 3 | 19.40 | 17 | 8 | |
| 31 | 3.65 | 103 8 | 556 | 134 | 8.00 | 1411/6 | 631 | | | | . | |
| 1 | 3.80 | 109% | 57/6 | 1 35 | 8.20 | 14116 | $6^{3}\frac{1}{4}$ | | | | | |

ABOVE REAMERS HAVE TAPER SHANKS AS FOLLOWS

| | | | , - - | | |
|-----------------------------|----------|-----------|---------------------------------|------------|----------|
| Diameters (inclusive)inches | 14 to 13 | 5 g to 33 | $^{15}_{16}$ to $1\frac{7}{32}$ | 114 to 133 | 134 to 3 |
| Morse Taper Shank number | 1 | 2 | 3 | 4 | 5 |

No. 116, SOLID REAMERS



| Diam. Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diam. Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diam, Inches | Price Each | Length Over All Inches | Length Flutes Inches |
|-----------------|---------------|------------------------------|----------------------------|-----------------|---------------|------------------------------|----------------------------|-----------------|---------------|------------------------------|----------------------------|
| 1/4 | 1.30 | $3\frac{9}{16}$ | 2 | 7/8 | 2.50 | 63/8 | 31/4 | 11/2 | 4.70 | 10 | 51/2 |
| 5/6 | 1.40 | 4 | 21/4 | 15/16 | 2.70 | 63/4 | 37/16 | 1% | 5.20 | 101/4 | 55/8 |
| 5/16 3/8 | 1.50 | 41/4 | 23/8 | 1 | 2.90 | 71/8 | 35/8 | 15/8 | 5.70 | 101/2 | 53/4 |
| 7/16 | 1.60 | 41/2 | 276 | 11/16 | 3.10 | 71/2 | 33/4 | 111/16 | 6.20 | 103/4 | 57/8 |
| 1/2 | 1.70 | 43/4 | 29/6 | 11/8 | 3.30 | 77/8 | 4 | 13/4 | 6.70 | 11 | 6 |
| 9/16 5/8 | 1.80 | 5 | 25/8 | 13/16 | 3.50 | 81/4 | 41/4 | 113/6 | 7.10 | 111/4 | 61/8 |
| 5/8 | 1.90 | 51/4 | 23/4 | 11/4 | 3.70 | 85/8 | 41/2 | 17/8 | 7.50 | 111/2 | 61/4 |
| 11/16 | 2.05 | 51/2 | 27/8 | 15/16 | 3.90 | 9 | 43/4 | 115/16 | 7.90 | 113/4 | 63/8 |
| 3/4 | 2.20 | 53/4 | 3 | 13/8 | 4.10 | 93/8 | 5 | 2 | 8.30 | 12 | 61/2 |
| 13/16 | 2.35 | 6 | 31/8 | 17/16 | 4.35 | 93/4 | 51/4 | | | | |

32nd sizes not listed furnished at intermediate prices, and 64th sizes at price of next larger 32nd size.

No. 120G EXPANSION REAMERS



Fig. 427A

| Diameter Inches | Price Each | Over All | Length of Flutes Inches | Diameter Inches | Price Each | Over All | Length of Flutes Inches | Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches |
|---------------------------------|----------------------|-------------|--|--------------------|----------------------|-------------|---|------------------------|----------------------|---|----------------------------------|
| 1/4 9 372 | 3.00 3.05 | 4 | 1½ 1½ | 7/16 15 15 | 3.30 3.35 3.40 | 5 5 6 | 2 2 21/ | 5/8 21 32 11/ | 4.00 4.20 4.40 | $\begin{bmatrix} 7 \\ 7 \\ 7 \end{bmatrix}$ | 3 3 |
| 572 5/66 112 3/8 13 | 3.10 3.15 3.20 | 4 5 | $egin{array}{c} 1\frac{1}{2} \\ 1\frac{1}{2} \\ 2 \end{array}$ | 1/2 1/7 9/6 | 3.50 3.65 | 6 | $ \begin{array}{c c} 21/2 \\ 21/2 \\ 21/2 \end{array} $ | 11/ 16 23 32 | 4.60 | 7 | 3 |
| 13 | 3.25 | 5 | 2 | 19 32 | 3.80 | 6 | 21/2 |) | | 1 . | |

No. 120E ADJUSTABLE REAMERS, STRAIGHT SHANK



Fig. 427B

| Diameter Inches | Price Each | Length Over All Inches | Diameter Inches | Price Each | Length Over All Inches | Diameter Inches | Price Each | Length Over All Inches |
|--------------------|---------------------|------------------------------|--------------------|---------------|------------------------------|--------------------------|----------------|------------------------------|
| 1 | 5.90 | 9 | 13 8 | 7.80 | 11 | 134 | 9.90 | 12 |
| 11/16 | $\frac{6.20}{6.50}$ | 10 10 | 17/6 | 8.20 8.60 | 11 11 | 1^{13}_{6} 1^{7}_{8} | 10.20 10.40 | 13 13 |
| 118 1316 | 6.80 | 10 | 11/2 | 9.00 | 12 | 115/6 | 10.60 | 13 |
| 11/4 | 7.10 | 10 | 15/8 | 9.30 | 12 | 2 | 10.80 | 13 |
| 156 | 7.40 | 11 | 111/16 | 9.60 | 12 | 1 | | l |

NO. 1201/E ADJUSTABLE REAMERS. MORSE TAPER SHANK



Fig. 427C

| Diameter Inches | Price Each | Length Over All Inches | Diameter Inches | Price Each | Length Over All Inches | Diameter Inches | Price Each | Length Over All Inches |
|-----------------------|---------------|--|--------------------|----------------|---|--------------------|----------------|------------------------------|
| 1 11 ₁₆ | 7.00 7.40 | 1014 1014 | 13 8 17/6 | 9.40 9.70 | 115/8 115/8 | 134 136 | 11.20 11.60 | 13½ 135¾ |
| 11.8 13/6 | 7.80 8.20 | $\begin{vmatrix} 10^{5} \frac{1}{8} \\ 10^{5} \frac{1}{8} \end{vmatrix}$ | 11/2 19/6 | 10.00 10.30 | 121% | 17/8 11/6 | 12.00 12.40 | 141 8 141 8 |
| $\frac{114}{156}$ | 8.60 9.00 | $\frac{111_{8}^{8}}{111_{4}^{8}}$ | 15/8 111/6 | 10.60 10.90 | $12^{5} \frac{8}{8}$ $12^{5} \frac{8}{8}$ | 2 2 | 12.80 | 1418 |

ABOVE REAMERS HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive)nches | 1 to 1% | 11% to 11% | 13 i to 2 |
|----------------------------|---------|------------|-----------|
| | | | |
| Morse Taper Shanknumber | 3 | 4 | 5 |

WRENCH FOR ADJUSTABLE REAMERS



Fig. 427 D

A wrench furnished with each reamer.

No. 118 FINISHING TAPER REAMER

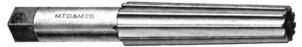


Fig. 6265A

No. 11812 ROUGHING TAPER REAMER



Fig. 6265B

| Number of | Price | Length Over All | Length of Flutes | SIZE OF FINISHING REAMER | | | |
|-----------|-------|-----------------|------------------|--------------------------|-----------|--|--|
| Taper | Each | Inches | Inches | Large End | Small End | | |
| 0 | 1.60 | 33/4 | 21/4 | .367 | .250 | | |
| 1 | 2.00 | 51/2 | 3 - | .517 | .367 | | |
| 2 | 2.60 | 7 - | 31/2 | .745 | .569 | | |
| 3 | 3.40 | 8 | 414 | .988 | . 775 | | |
| 4 | 4.20 | 9 | $5\frac{1}{4}$ | 1.289 | 1.017 | | |
| 5 | 6.60 | 10 | 61/4 | 1.799 | 1.471 | | |
| 6 | 12.00 | 12 | 81/2 | 2.555 | 2.112 | | |
| 7 | 35.00 | 16 | 12 | 3.371 | 2.746 | | |

NO. 119 STRAIGHT SHANK FLUTED CHUCKING REAMERS

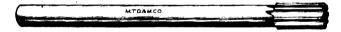


Fig. 6265C

| Diam. Inches | Price Each | Length Over All | Length Flutes | Diam. | Price Each | Length Over All | Length Flutes | Diam. Inches | Price Each | Length Over All | Length Flutes |
|---|---------------|--------------------|-------------------------------------|-----------------|---------------|--------------------|-------------------|----------------------------|---------------|--------------------|------------------|
| Inches | Bacii | Inches | Inches | Inches | racii | Inches | Inches | menes | 1704(-11 | Inches | Inches |
| 14 | .90 | 6 | 11/2 | 32 | 2.10 | 10 | 25 6 | 113/16 | 4.40 | 131/2 | 4 |
| 72 | .95 | 6 | 11/2 | 15/6 | 2.15 | 10 | 25 8 | 17% | 4.60 | 14 | 41/4 |
| 5/4 | 1.00 | 6 | 11/2 | 31 | 2.25 | 10 | 25 4 | 1156 | 4.80 | 14 | 414 |
| 32 5/6 11 11 | 1.05 | 6 | $11\sqrt{2}$ | 1 " | 2.30 | 101/6 | 234 | 2 | 5.00 | 14 | 411 |
| 32 | 1.10 | 7 | 134 | $1\frac{1}{32}$ | 2.40 | 1013 | 234 | 216 | 5.30 | 141/2 | 41/2 |
| 13 | 1.15 | 7 | 134 | 116 | 2.45 | 101/2 | 234 | 21/8 | 5.60 | 141/2 | 41/5 |
| 7 8 3 2 7 6 3 2 2 7 6 3 2 2 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 1.20 | 7 | 134 | $1\frac{3}{32}$ | 2.55 | 101/2 | $2\frac{3}{4}$ | 23/6 | 5.90 | 141/2 | 41/2 |
| 45 | 1.25 | 7 | 134 | 11% | 2.60 | 11 | 27/8 | $2\iota_1^0$ | 6.20 | 141/3 | 41/3 |
| 1/2 | 1.30 | 8 | 2 4 | 1_{32}^{5} | 2.70 | 11 | 27% | $25\frac{7}{16}$ | 6.50 | 15 | $43\frac{7}{4}$ |
| 1/139/155/812/692 135/231/692 | 1.35 | 8 | 2 | 13/6 | 2.75 | 11 | $2^{\frac{7}{8}}$ | 23 3 | 6.80 | 15 | 437 |
| % | 1.40 | 8 | $\bar{2}$ | 1 37 | 2.85 | 11 | 27.8 | 276 | 7.10 | 15 | 437 |
| 18 | 1.45 | 8 | $\bar{2}$ | 117 | 2.90 | 111/2 | 3 | 21/2 | 7.40 | 15 | $43\frac{7}{4}$ |
| 5% | 1.50 | 9 | 217 | 156 | 3.05 | 1112 | 3 | 296 | 7.70 | 151/9 | 5 - |
| 21 I | 1.55 | 9 | $\bar{2}i\vec{7}$ | 13 % | 3.20 | 12 | 314 | 25 % | 8.00 | 151/3 | 5 |
| iίζ | 1.60 | 9 | 217 | 176 | 3.35 | 12 | 317 | 211/2 | 8.35 | 1513 | 5 |
| 23 | 1.65 | 9 | $\mathbf{\tilde{2}}$ | 11/2 | 3,50 | 121/2 | 31/3 | $\frac{1}{2}3\frac{16}{4}$ | 8.70 | 151/2 | 5 |
| 3/4 | 1.70 | 91/2 | 21/3 | 197 | 3.65 | $12\frac{1}{2}$ | 31/2 | 2136 | 9.00 | 16 | $5\frac{1}{4}$ |
| 25 | 1.80 | 91/2 | 21/2 | 15% | 3.80 | 13 | 334 | $ar{2}$ 7 $ar{5}$ | 9.35 | 16 | 517 |
| 132 | 1.85 | 912 | 21/2 | 111/2 | 4.00 | 13 | 334 | 215/6 | 9.70 | 16 | 517 |
| 37 | 1.90 | 91/2 | $2i_2^2$ | 134 | 4:20 | 131/2 | 4 | 3 16 | 10.00 | 16 | 514 |
| 2 Card 2 Card - 8 | 2.00 | 10 2 | $\mathbf{\tilde{2}}^{5}\frac{2}{8}$ | -,4 <u>.</u> | | /2 | ! | | | 1 | |
| / 8 | | | - 8 | | | | | | | | |

No. 119A FLUTED CHUCKING REAMERS
MORSE TAPER SHANK



Fig. 6266A

| Diam. Inches | Price Each | Length Over All Inches | Length Flutes Inches | Inches | Price Each | Length Over All Inches | Length Flutes Inches | Inches | Price Each | Length Over All Inches | Length Flutes Inches |
|--|---------------|------------------------------|----------------------------|-----------------|---------------|------------------------------|----------------------------|--------------------|---------------|------------------------------|----------------------------|
| 1/4 | 1.20 | 6 | 11/2 | 29 32 | 2.60 | 10 | 25% | 176 | 5.70 | 14 | 414 |
| 27 | 1.20 | 6 | 11/2 | 15/6 | 2.65 | 10 | 25% | 113/6 | 5.95 | J4 | 414 |
| 5/6 | 1.30 | 6 | 11/2 | 32 | 2.70 | 10 | 25 8 | 2 | 6.20 | 14 | 411 |
| 113 | 1.30 | 6 | $1\frac{1}{2}$ | 1 | 2.75 | 101/2 | 23/4 | 216 | 6.50 | 141/3 | 41/2 |
| 3.7 | 1.45 | 7 | 134 | $1\frac{1}{32}$ | 2.80 | 101/2 | 234 | 218 | 6.80 | 141/3 | 41/2 |
| 13 | 1.50 | 7 | 134 | 1 16 | 2.85 | 1012 | 234 | 23/16 | 7.10 | 1412 | 41/2 |
| 7/6 | 1.55 | 7 | $1\frac{3}{4}$ | 1_{32}^{30} | 2.95 | 101/2 | 23/4 | $2^{1}\frac{3}{4}$ | 7.40 | 141/2 | 41/2 |
| 13 | 1.60 | 7 | 134 | 11/8 | 3.10 | 11 | 27 | 2^{5}_{16} | 7.70 | 15 | 43 |
| 1/2 | 1.65 | 8 8 | 1 2 | 1_{32}^{53} | 3.20 | 11 | 27 g | 2^3 s | 8.00 | 15 | 431 |
| 17 | 1.70 | 8 | 2 | 13/6 | 3.30 | 11 | 27% | 276 | 8.40 | 15 | 434 |
| 976 | 1.75 | 8 | $\frac{1}{2}$ | $1\frac{7}{32}$ | 3.40 | 11 | 27% | $2\frac{1}{2}$ | 8.80 | 15 | 437 |
| 19 | 1.80 | 8 | 2 | 114 | 3.50 | 111/2 | 3 | 297 | 9.20 | 151/9 | 5 |
| 5/8 | 1.90 | 9 | 214 | 1546 | 3.70 | 1113 | 3 | 25 8 | 9.60 | 151/2 | 5 |
| 312 | 1.95 | 9 | 21 | 13 8 | 3.95 | 12 | 314 | 2í1 ₁₆ | 10.00 | 15_{2}^{12} | 5 |
| 1176 | 2.00 | 9 | 214 | 17/6 | 4.15 | 12 | 317 | $2\frac{3}{4}$ | 10.40 | 151/3 | 5 5 5 5 5 5 |
| 33 | 2.10 | 9 | $ 21_{4}^{2} $ | 11/2 | 4.40 | 1214 | 312 | 213/6 | 10.80 | 16 | 514 |
| 34 | 2.20 | 91/2 | 21/2 | 1976 | 4.60 | $12\frac{1}{2}$ | 31/2 | $27\frac{7}{8}$ | 11.20 | 16 | 5!1 |
| 35 | 2.30 | 91,7 | $2\frac{1}{2}$ | 15% | 4.85 | 13 | $3^3\bar{4}$ | 215/16 | 11.60 | 16 | 517 |
| 13/6 | 2.40 | 91/2 | 21/2 | 111/16 | 5.10 | 13 | 33 7 | 3 | 12.00 | 16 | 51 |
| 17 16 17 17 16 17 16 17 16 17 16 17 17 | 2.50 | 912 | $2\frac{1}{2}$ | 134 | 5.30 | 131-չ | 4 | ' | | | |
| 7% | 2.55 | 10 | $2^{5\frac{7}{8}}$ | 1^{13}_{16} | 5.50 | $13\sqrt{2}$ | 4 | | • • • • • | | ١ |

ABOVE REAMERS HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive) inches | 1/4 to 18 | 5 8 to 32 | 15/6 to 1 3/2 | 1^{1}_{4} to 1^{11}_{16} | 13 í to 3 |
|------------------------------|-----------|-----------|---------------|------------------------------|-----------|
| Morse Taper Shanknumber | 1 | 2 | 3 | 4 | 5 |

These reamers will be furnished to order .001 to .010-inch under size at regular prices.

No. 120B TAPER BIT STOCK REAMERS



Fig. 6266B

| Nominal Size Inches | Price Each | Length Over All Inches | Length Flutes Inches | | Price Each | ngth Over All Inches | Length Flutes Inches | Size | Price Each | Length Over All Inches | Length Flutes Inches |
|---------------------------|---------------|------------------------------|-----------------------------|-------|---------------|----------------------------|----------------------------|-----------------|---------------|------------------------------|----------------------------|
| 16 | .35 | 334 | 15% | 5 8 | .90 | 434 | 25% | 11/8 | 2.40 | 53/4 | 35 S |
| 3 | .35 | 37/8 | 134 | 11/16 | 1.05 | 478 | 23/4 | 13/16 | 2.60 | 57 s | 334 |
| 14 | .45 | 4 | 178 | 34 | 1.20 | 5 | 278 | 11/4 | 2.80 | 6 | 37, |
| 516 | .50 | 41/8 | 2 | 13 | 1.40 | $5\frac{1}{8}$ | 3 | 1 16 | 3.00 | 618 | 4 |
| 3 3 | .55 | 414 | $\mid 2\frac{1}{8} \mid$ | 74 | 1.60 | 5!4 | 31/8 | 13/8 | 3.20 | $6^{1}4$ | 418 |
| 76 | .60 | 43 8 | $2^{1}4$ | 15 | 1.80 | 5^{3}_{8} | 3^{1}_{4} | $1\frac{7}{16}$ | 3.40 | 63.8 | 41,4 |
| 1/2 | .70 | 41/2 | $ 2^3, $ | 1 | 2.00 | $5\frac{1}{2}$ | 33_8 | 11/2 | 3.60 | $6\frac{1}{2}$ | 438 |
| 97 | .80 | 45 8 | $\lfloor 2^{1}_{2} \rfloor$ | 116 | 2.20 | 55_8 | 3^{1}_{2} | | | | <u></u> |

Taper 1 inch to the foot. Diameter at large end of flutes is $\frac{1}{16}$ -inch larger than nominal size.

NO. 119B STRAIGHT SHANK FLUTED CHUCKING REAMERS

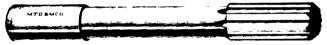


Fig. 6267A
FOR SCREW OR CHUCKING MACHINES

| | | FUI | 1 301 | EM C | 'H CH | UCKI | AC MY | CHII4E | | | |
|--|---------------------|------------------------------|-------------------------|-----------------------------|-------------------------------|-------------------------------|---|------------------------------|---------------------------|----------------|-----------------|
| Diam. Inches | Price Each | Length Over All Inches | Flutes Inches | Shank | Inche« | Diam. Inches | Price Each | Length Over All Inches | Flutes Inches | Shank | Inches |
| 14 | 1.20 | 6 | 11/2 | 14 | 11/2 | 1 372 | 3.40 | . 11 | $27_{ m s}$ | 1 | $2^{3}4$ |
| 20 | 1.20 | 6 | 11/2 | 14 | 11/2 | $1\frac{1}{4}$ | 3.50 | 111/9 | 3 | 117 | 3 - |
| 52 | 1.30 | 6 | 11/2 | 1 1/4 | 11/2 | 156 | 3.70 | 111/2 | 3 | -197 | 3 |
| 37 5/6 11 32 | 1.30 | 6 | 11/3 | i i7 − | 11/2 | 13 8 | 3.95 | 12 | 314 | 117 | 3 |
| 3/2 | 1.45 | 7 | 137 | 3 3 | $1\widetilde{3}$ | 17/16 | 4.15 | $\overline{12}$ | 314 | 117 | 3 |
| 13 | 1.50 | 7 | 137 | 3 3 | 134 | 11/2 | 4.40 | 121/6 | 31/3 | 117 | 3 |
| 32 7/ | 1.55 | 7 | 134 | 3 . | 134 | 1916 | 4.60 | $12i_{2}^{2}$ | 313 | 117 | 3 |
| 15 | 1.60 | 7 | 134 | 3 8 | 134 | 15 3 | $\frac{1.85}{4.85}$ | 13 | $\frac{33\frac{2}{4}}{3}$ | 117 | 3 3 3 |
| 32 1∠ | 1.65 | 8 | 2 | 1/2 | $ \mathbf{\hat{2}}^{'4} $ | 100 | 5.10 | 13 | 334 | 111 | 3 |
| 17 | 1.70 | 8 | 5 | 1/2 | | $\frac{13}{4}$ | 5.30 | 131/4 | 4 | 111 | 3 |
| 32 | 1.75 | 8 | 2 2 | 1.6 | 5 | 113 ₁₆ | 5.50 | 131/2 | 1.4 | 112 | 3 |
| 3/872/8652/27/2/6622 137/131/139/1692 | 1.80 | ' 8 | $\frac{5}{2}$ | $\frac{1}{2}$ $\frac{1}{2}$ | 2 2 2 | | 5.70 | 14 | 414 | 11. | 3 3 3 |
| 32 5/ | 1.90 | 9 | 214 | 5 . | $-\mathbf{\tilde{2}}_{1_{1}}$ | 115 | 5.95 | 14 | 41. | 11 | 3 |
| 5 % 8 | 1.95 | 9 | $\frac{2}{2}$ | 5 ? | 2^{14} | $\frac{1}{2}$ | 6.20 | 14 | 417 | 1114 | 3 |
| 312 112 | 2.00 | 9 | 217 | | 214 | | 6.50 | 1416 | | 1 -/- | 31/2 |
| 16 23 32 | $\frac{2.00}{2.10}$ | 1 9 | 214 | 5.8 | $\frac{2}{2} \frac{4}{1}$ | $\frac{2\frac{1}{16}}{2^{1}}$ | 6.80 | $14\frac{1}{2}$ | 412 | 11/2 | 31/2 |
| 32 | $\frac{2.10}{2.20}$ | | 7.1 | 3/ | 214 | | 7.10 | 141/2 | 41/2 | 11/2 | 31/2 |
| 3/4582 13/166 2577.8 | | 91/2 | | - 14 | 214 | $\frac{237}{216}$ | 7.40 | | | 11/2 | 21/2 |
| 37 | 2.30 | 912 | | 34 | | ~ + | | 141/2 | 41/2 | 11/2 | 31/2 |
| <u></u> | $\frac{2.40}{0.50}$ | $91\overline{2}$ | $\frac{21}{2}$ | 34 | 214 | $\frac{2^{5}}{9^{3}}$ | $\begin{array}{c} 7.70 \\ 8.00 \end{array}$ | 15 | 434 | 11/2 | 3/2 |
| 34 | 2.50 | $91\overline{2}$ | 21/2 | 24 | 214 | 23 3 | | 15 | 434 | 11/2 | 31/2 |
| <u> </u> | 2.55 | 10 | $\frac{2^5}{3}$ | <u>'s</u> | 21/2 | 2716 | 8.40 | 15 | 434 | 11/2 | 31/2 |
| 25 35 15 16 | 2.60 | 10 | 208 | 28 | 21/2 | $\frac{21}{2}$ | 8.80 | 15 | 43/4 | 11/2 | 31/2 |
| 116 | 2.65 | 10 | $\frac{2^{5}}{2^{5}}$ 8 | - 18 | 21/2 | 2976 | 9.20 | 151/2 | 5 | 11/2 | 3^{1}_{2} |
| 31 | 2.70 | 10 | $-25\mathrm{s}$ | 7/8 | $2\frac{1}{2}$ | 25 8 | 9.60 | 151/2 | 5 5 | 11/2 | 31/2 |
| 1 . | 2.75 | $10\frac{1}{2}$ | $2^{3}4$ | 1 | 234 | 2^{11}_{16} | 10.00 | $15\frac{1}{2}$ | 5 | 11/2 | 31/2 |
| $1_{\frac{1}{32}}$ | 2.80 | $10^{\frac{7}{2}}$ | 2^3 | 1 | 2^3 | 2^3 (| 10.40 | $15\frac{1}{2}$ | 5 | $1\frac{1}{2}$ | 31/2 |
| 11/6 | 2.85 | $10\frac{1}{2}$ | $2^{3}4$ | 1 | 234 | 2^{13} | 10.80 | 16 | $ 51_{4} $ | 11/2 | $3\frac{1}{2}$ |
| $1_{\frac{3}{32}}$ | 2.95 | $10^{1/2}$ | $^{-23}_{4}$ | 1 | $23\overline{4}$ | 274 | 11.20 | 16 | 51_{4}^{-} | 11/2 | $-3\frac{1}{2}$ |
| 11/8 | 3.10 | 11 | $2^7\mathrm{s}$ | 1 | 234 | 2^{15}_{16} | 11.60 | 16 | 51_{1} | 11/2 | $3\frac{1}{2}$ |
| $1_{\frac{3}{32}}$ | 3.20 | 11 | 27/8 | 1 | 234 | 3 | 12.00 | 16 | 5^{1}_{4} | 13/4 | 4 |
| 13/6 | 3.30 | 11 | 27% | 1 | 237 | | | | 1 | | |

These reamers will be furnished to order .001 to .010-inch under size at regular prices.

No. 120D TAPER PIN REAMERS

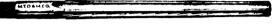


Fig. 6267B TAPER 14-INCH PER FOOT

| TAPEN 1-110H PEN FOOT | | | | | | | | | | | | |
|-----------------------|---------------|------------------------------|------------------------------|------------------------------------|-----------------|------------------------------|------------------------------|----------------------------|----------------|------------------------|--|----------------------------|
| Size | Price Each | Diam. Small End Inches | Length Over All Inches | Length Flutes Inches Size | Number Price | Diam. Small End Inches | Length Over All Inches | Length Flutes Inches | Size Number | Price Each Diam. | Inches Length Over All Inches | Llength Futes Inches |
| 0 | 1.00 | .135 | 214 | 114 | 2.0 | $0^{-}.24\overline{0}$. | 415 | 3 | 10 | 4.00 .58 | 31 9 | 7 |
| 1 | 1.00 | .146 | 21 2 | 13, 1 | 5 2.2 | $5_{\pm}.279_{\pm}$ | | 356 | 11 | 4.75 .70 | 06 1114 | 81, |
| 2 | 1,25 | .162 | 3 | 2 ' | 7 - 2.5 | 0 .331 | 6 | 41/2 | 12 | $5.50 \pm .8$ | 12 133 | 10 |
| 3 | 1.50 | .183 | 31,5 | 211 | 3 3.0 | $0^{+}.398^{-}$ | 634 | | | 6.50 1.00 | 09 16 | 12 |
| 4 | 1.75 | .208 | 4 | $2^{1}\frac{7}{2}$ | 3.5 | 0 .482 | 8 | | | | 50 181/4 | 14 |

No. 120 STRAIGHT SHANK

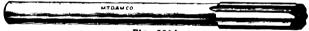


Fig. 664A

No. 120 ROSE CHUCKING REAMERS, STRAIGHT SHANK

| Diameter Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diameter Inches | Price Each | Length Over All Inches | Length Flutes Inches | Diameter Inches | Price Each | Length Over All Inches | Length Flute Inches |
|--|---------------|---------------------------------|----------------------------|---------------------------------|---------------|---------------------------------|----------------------------|--------------------|---------------|---------------------------------|---------------------------|
| 1/4 | .80 | 6 | 11/2 | 29 32 | 1.90 | 10 | 25/8 | 17/8 | 4.20 | 14 | 41/4 |
| 1/4 972 16 122 18 18 18 18 18 18 1 | .85 | 6 | 11/2 | 15/16 | 1.95 | 10 | 25/8 | 115/6 | 4.40 | 14 | 41/4 |
| 5/6 | .90 | 6 | 11/2 | $\frac{31}{32}$ | 2.05 | 10 | 25/8 | 2 | 4.60 | 14 | 41/4 |
| 11 | .95 | 6 | 11/2 | 1 | 2.10 | 101/2 | 23/4 | 21/16 | 4.90 | 141/2 | 41/2 |
| 3/8 | 1.00 | 7 | 134 | $1\frac{1}{32}$ | 2.20 | 101/2 | 23/4 | 21/8 | 5.20 | 141/2 | 41/2 |
| 13 | 1.05 | 7 | 13/4 | 11/16 | 2.25 | 101/2 | 23/4 | 23/16 | 5.50 | 141/2 | 41/2 |
| 7/6 | 1.10 | 7 | 134 | $1\frac{3}{32}$ | 2.35 | 101/2 | 23/4 | 21/4 | 5.80 | 141/2 | 41/2 |
| 15 | 1.15 | 7 | 134 | 11/8 | 2.40 | 11 | 27/8 | 25/6 | 6.10 | 15 | 43/4 |
| 1/2 | 1.20 | 8 | 2 | 15 | 2.50 | 11 | 27/8 | 23/8 | 6.40 | 15 | 43/4 |
| 17 | 1.25 | 8 | 2 | $\frac{13_{16}}{1\frac{7}{32}}$ | 2.55 | 11 | 27/8 | 27/6 | 6.80 | 15 | 43/4 |
| 9/16 | 1.30 | 8 | 2 | $1\frac{7}{32}$ | 2.65 | 11 | 27/8 | 21/2 | 7.20 | 15 | 43/4 |
| 19 | 1.35 | 8 | 2 | 11/4 | 2.70 | 111/2 | 3 | 2% | 7.50 | 151/2 | 5 |
| 5/8 | 1.40 | 9 | 21/4 | 15/16 | 2.85 | 111/2 | 3 | 25/8 | 7.80 | 151/2 | 5 5 |
| 21 | 1.45 | 9 | 21/4 | 13/8 | 3.00 | 12 | 31/4 | 211/16 | 8.10 | 151/2 | 5 |
| 11/16 | 1.50 | 9 | 21/4 | 17/16 | 3.15 | 12 | 31/4 | 23/4 | 8.40 | 151/2 | 5 |
| 23 | 1.55 | 9 | 21/4 | 11/2 | 3.30 | $12\frac{1}{2}$ | 31/2 | 213/16 | 8.80 | 16 | 514 |
| 3/4 | 1.60 | 91/2 | 21/2 | 1% | 3.45 | 121/2 | 31/2 | 27/8 | 9.20 | 16 | 514 |
| 332 3/4 25 3/2 | 1.65 | 91/2 | 21/2 | 15/8 | 3.60 | 13 | 33/4 | 215/16 | 9.60 | 16 | 51/4 |
| 13/16 | 1.70 | 91/2 | $2\frac{1}{2}$ | 111/16 | 3.75 | 13 | 33/4 | 3 | 10.00 | 16 | 514 |
| 13 16 27 32 | 1.75 | 91/2 | $2\frac{1}{2}$ | 13/4 | 3.90 | 131/2 | 4 | | | | |
| 7/8 | 1.80 | 10 | 25/8 | 113/16 | 4.05 | 131/2 | 4 | | | | |

No. 120½ ROSE CHUCKING REAMERS, MORSE TAPER SHANK

| 14 | 1.20 | 6 | 11/2 | $\frac{29}{32}$ | 2.60 | 10 | 25% | 17/8 | 5.70 | 14 | 41,4 |
|---------------------------------------|------|----------|-----------------|-------------------------|------|---------------------|----------------|-----------------|-------|-----------------|------------------------|
| 9 32 | 1.20 | 6 | 11/2 | 156 | 2.65 | 10 | 25 🐇 | 1136 | 5.95 | 14 | 41, |
| 5 16 | 1.30 | 6 | 11/2 | 15.7 216 31 32 | 2.70 | 10 | 25 8 | 2 | 6.20 | 14 | 414 |
| 33 | 1.30 | 6 | 11/2 | 1 " | 2.75 | 1012 | 23/4 | 21/6 | 6.50 | 141/2 | 41/2 |
| 3 ₈ | 1.45 | 7 | 134 | 1_{32} | 2.80 | 101/2 | 237 | 21% | 6.80 | 141/2 | $4\hat{1}_2$ |
| 43 | 1.50 | 7 | 134 | 11/6 | 2.85 | $101\frac{7}{2}$ | 234 | 23/15 | 7.10 | $14\frac{1}{2}$ | 41.5 |
| 13 7 16 15 15 | 1.55 | 7 | 134 | $1\frac{3}{3^2}$ | 2.95 | 101/2 | 234 | 21_{1} | 7.40 | $14\frac{1}{2}$ | 41, |
| 13 | 1.60 | 7 | 134 | 11% | 3.10 | 11 | 27% | 25% | 7.70 | 15 | 43 |
| 1/2 | 1.65 | 8 | 2 . | 1_{32}^{5} | 3.20 | 11 | $27/_8$ | $23\frac{9}{8}$ | 8.00 | 15 | 434 434 434 5 |
| 37 | 1.70 | 8 | 2 | 13/6 | 3.30 | 11 | 27/s | $2\frac{7}{6}$ | 8.40 | 15 | 437 |
| 916 | 1.75 | 8 | 2 | $1\frac{7}{32}$ | 3.40 | 11 | 278 | $2\frac{1}{2}$ | 8.80 | 15 | 43, |
| 33 | 1.80 | 8 | 2 | 114 | 3.50 | 111/2 | 3 | $2\frac{5}{6}$ | 9.20 | 151/2 | 5 1 |
| 5 8 | 1.90 | 9 | 204 | 1_{16} | 3.70 | $[11!_{2}]$ | 3 | 25% | 9.60 | 1512 | 5 |
| $\frac{21}{32}$ | 1.95 | 9 | 2^{14} | 1^3 | 3.95 | 12 | 31_{4} | 20_{6} | 10.00 | 151/2 | 5 |
| | 2.00 | 9 | 214 | $1\frac{7}{16}$ | 4.15 | 12 | 314 | 234 | 10.40 | $15\frac{1}{2}$ | 5 5! ₄ |
| 116 116 136 14 152 152 | 2.10 | 9 | 2^{1} | $1\frac{1}{2}$ | 4.40 | 12^{1} $^{\circ}$ | 31/2 | 2^{13}_{6} | 10.80 | 16 | 514 |
| 34 | 2.20 | 91 | $2\frac{1}{2}$ | 1976 | 4.60 | $12^{1\frac{7}{2}}$ | $3\frac{1}{2}$ | $2\frac{7}{8}$ | 11.20 | 16 | 514 |
| 33 | 2.30 | 91_{2} | 2^{1} | $15 \lesssim$ | 4.85 | 13 | 33/4 | 2^{15}_{16} | 11.60 | 16 | 5), |
| 13 | 2.40 | 91_2 | 21/2 | 1^{11}_{16} | 5.10 | 13 | $3^{3}4$ | 3 | 12.00 | 16 | 51, |
| $\frac{27}{32}$ | 2.50 | 91_{2} | 21/2 | 134 | 5.30 | 131 2 | 4 | | | | |
| 13 16 27 32 7 8 | 2.55 | 10 | $25\frac{1}{8}$ | 1^{13}_{16} | 5.50 | $13^{1}\frac{7}{2}$ | 4 | | | | i |

No. 12013 REAMERS HAVE MORSE TAPER SHANKS AS. FOLLOWS

| Diameters (inclusive) | inches | 1, to 33 | to 3 | 2 156 to 1 32 | 11% to $14%$ | 134 to 3 | |
|-----------------------|--------|----------|------|---------------|--------------|----------|--|
| Morse Taper Shank | number | 1 | 2 | 3 | 4 | 5 | |

No. 120A LOCOMOTIVE TAPER REAMERS



Fig. 147A

| Diameter ½ In. From Small End Inches | Price Each | Length Over All Ins. | Length Flutes Ins. | Diameter ¼ In. From Small End Inches | Price Each | | Length Flutes Ins. | Diameter 1. In. From Small End Inches | Price Each | Length Over All Ins. | Length Flutes Ins. |
|---|---------------|-------------------------------|--------------------------|---|---------------|-----------------|--------------------------|--|---------------|-------------------------------|--------------------------|
| 1/4 | 2.20 | 55/16 | 4 | 11/6 | 3.80 | 97/8 | 8 | 13/8 | 8.00 | 141/2 | 12 |
| 32 | 2.20 | 55/6 | 4 | 3/4 13/ 16 | 4.10 | 97% | 8 | 17/6 | 8.50 | 141/2 | 12 |
| 516 | 2.25 | 55/16 | 4 | 13/6 | 4.50 | 111/4 | 9 | 11/2 | 9.00 | 141/2 | 12 |
| 32 | 2.25 | $5\frac{5}{16}$ | 4 | /8 | 4.80 | 111/4 | 9 | 1% | 9.60 | 161/2 | 14 |
| 3.8 | 2 30 | 65/6 | 5 | 15/6 | [5.10] | 111/4 | 9 | 15/8 | 10.20 | 161/2 | 14 |
| 33 | 2.40 | 6516 | 5 | 1 | 5.40 | $11\frac{1}{4}$ | 9 | 111/16 | 10.85 | 161/2 | 14 |
| 7∕16 | 2.55 | 754 | 6 | 11/6 | 5.70 | 111/4 | 9 | 13/4 | 11.60 | 161/2 | 14 |
| 32 | 2.70 | 75% | 6 | 11/8 | 6.20 | $12\frac{1}{4}$ | 10 | 113/6 | 12.40 | 181/2 | 16 |
| 1/2 | 3.00 | 85 g | 7 | 13/6 | 6.60 | 12^{1}_{4} | 10 | 11/8 | 14.00 | $18\frac{1}{2}$ | 16 |
| 916 | 3.20 | 97/8 | 8 | 11/4 | 7 00 | 12^{1}_{4} | 10 | 115/6 | 15.00 | 181/2 | 16 |
| 5 8 | 3.50 | 97/8 | 8 | 15/6 | 7.60 | $14\frac{1}{2}$ | 12 | 2 | 16.00 | 181/2 | 16 |

The above Reamers taper $\frac{1}{16}$ -inch per foot or $\frac{3}{32}$ -inch per foot. Specify when ordering which taper is desired.

Reamers of other taper per foot than as specified above furnished as desired. These Reamers have an increased taper at the end, one-half inch in length.

No. 120½A LOCOMOTIVE TAPER REAMERS MORSE TAPER SHANK



Fig. 147B

| Diameter 4 In. From Small End Inches | Price Each | Over | Length Flutes Ins. | Diameter 14 In. From Small End Inches | Price Each | Over | Length Flutes Ins. | Diameter In. From Small End Inches | Price Each | Length Over All Ins. | Length Flutes Ins. |
|--|---------------------|-------|--------------------------|---------------------------------------|--|---------------|--------------------------|---|----------------|---------------------------------|--------------------------|
| 1/4 | 3.10 3.10 | | 4 | 11/6 3/ | $\frac{4.50}{4.90}$ | | 8 | 13 g 176 | 8.80 9.35 | 17½ 17½ | $\frac{12}{12}$ |
| 32 5/6 11 32 3/8 | 3.15 3.15 | 75/6 | 4 | 3/4 13/ 16 | $5.30 \\ 5.70$ | 12^{13}_{6} | 9 | 1½ 1% | 9.90 10.55 | 17½ 19½ | 12 14 |
| | 3.20 | 856 | 5 | 7/8 15/6 | 6.05 | 131/2 | 9 | 15/8 | 11.20 | 191/2 | 14 14 |
| *** **** | $\frac{3.25}{3.30}$ | 95% | 6 | 116 | $\begin{bmatrix} 6.40 \\ 6.60 \end{bmatrix}$ | 1312 | 9 | 111/16 13/4 | 11.95 12.75 | $19\frac{1}{2}$ $20\frac{3}{4}$ | 14 |
| 132 1/2 | $3.45 \\ 3.50$ | 1056 | 7 | 13/6 | $egin{array}{c} 6.80 \\ 7.25 \end{array}$ | 141/2 | 10 10 | 13/6 17/8 | 13.65 14.60 | $22\frac{3}{4}$ $22\frac{3}{4}$ | 16 16 |
| 137 1852 127 1852 1858 1858 1858 1858 | $ 3.50 \\ 4.00$ | 115/6 | 8 | $\frac{11_4}{15_{16}}$ | $\begin{vmatrix} 7.70 \\ 8.35 \end{vmatrix}$ | | 10 12 | 115/6 | 15.70 16.80 | $22\frac{3}{4}$ $22\frac{3}{4}$ | 16 16 |

ABOVE REAMERS HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive)inches | 14 to % | 5% to 7/8 | 15% to 13% | 11/4 to 11/16 | 13/4 to 2 |
|-----------------------------|---------|----------------|------------|---------------|-----------|
| Morse Taper Shank number | 1 | $\overline{2}$ | 3 | 4 | 5 |

The above Reamers taper ${}^{1}_{16}$ -inch per foot or ${}^{3}_{2}$ -inch per foot. Specify when ordering which taper is desired.

Reamers of other taper per foot than as specified above furnished as desired. These Reamers have an increased taper at the end, one-half inch in length.

Special sizes made to order at special prices.

MORSE TAPER BRIDGE REAMERS

No. 120C, STRAIGHT SHANK



Fig. 429A

| | iamete ches, | | Price Each | Length Over All Inches | Length Flutes Inches | Length From B to C Inches | υ | iamete ches, B | | Price Each | Length Over All Inches | Length Flutes Inches | Length From B to C Inches |
|-----------------------------------|------------------|--------------|----------------|--|----------------------------|------------------------------------|--------------|-----------------------------|------------------|---------------|---------------------------------|----------------------------|------------------------------------|
| 516 | 14 | 316 | 2.75 | 534 | 414 | 11 8 | 15/6 | 37 32 32 32 | 11/16 | 3.70 | 91/2 | 7 | 2 |
| 3 8 7/16 1/2 9/16 5/8 | 516 3 | 14 | 2.75 | 534 | 414 | 11/8 | 1 | 32 | 3/4 | 3.90 | 91/2 | 7 | 2 |
| 16 | 7.8 | 516 3 | $2.75 \\ 2.75$ | $5^{3}\frac{7}{4}$ $5^{3}\frac{7}{4}$ | 41 ₄ | $\frac{11}{11}$ | 11/6 | 31 11 11 | 187 16 7/8 | 4.00 | $9\frac{1}{2}$ | 4 | 9 |
| 9% | 716 133 | ે ક 5∕16 | 2.80 | 91/2 | 7 | 2.8 | 13/16 | $\frac{1}{3}$ $\frac{1}{3}$ | 15/6 | 4.60 | 912 | 7 | $\tilde{2}$ |
| 5.8 | $\frac{37}{32}$ | 3 8 | 2.90 | 91/2 | 7 | $\tilde{2}$ | 11/4 | $1\frac{3}{32}$ | 1 | 4.90 | 912 | 7 | $ar{f 2}$ |
| 11/4 | <u> 19</u> | 7 /16 | 3.00 | 91/2 | 7 | 2 | 15/6 | $1\frac{7}{32}$ | 11/16 | 5.20 | 91/2 | 7 | 2 |
| 3/4 13/6 | 312 | 12 | 3.10 | 91/2 | 7 | 2 | 1^{3}_{-8} | $1\frac{9}{32}$ | 11/8 | 5.60 | 91/2 | 7 | 2 |
| 13\6 7\8 | 280080 280080 | 9 Z | 3.30 | 91/2 | 7 | 2 | 17/16 | $\frac{1}{3}$ | 13/6 11/4 | 6.00 6.40 | 91/2 | 7 | 2 |

No. 120%C, MORSE TAPER SHANK



Fig. 429B

| Diameter Inches, at A B C | Price Leng Over Each All Inche | Flutes | B to C | | iamete ches. | | Price Each | Length Over All Inches | Flutes | Length From B to C Inches |
|--|--|---|---|---|--|--|--|--|---|---|
| 516 1 4 516 8 7 16 1 5 16 8 7 16 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 2.75 79, 2.75 79, 2.75 79, 2.75 79, 2.80 105, 2.90 107, 3.00 107, 3.10 107, 3.30 107, 3.50 107, | 1 4 4 4 4 4 4 7 7 7 7 7 7 7 7 7 7 7 7 7 | 11/8 11/8 11/8 11/8 2 2 2 2 2 2 2 | 15/16 1 1/16 11/18 13/16 11/4 15/16 13/8 17/16 | 1 32 1 32 1 35 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 2 1 3 3 3 3 | 11/6 3/4 13/6 7/8 15/6 1 1/6 1 1/8 1 1/6 1 1/4 | 3.70 3.90 4.00 4.30 4.60 4.90 5.20 5.60 6.00 6.40 | 115 8 115 8 115 8 115 8 115 8 115 8 125 8 125 8 125 8 125 8 | 777777777777777777777777777777777777777 | 2 |

TAPER SHANK REAMERS HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive) at point "A"inches | 5/ to 9/ | 5.4 to 7.4 | 15' to 13/ | 11.1 to 11/ |
|--|----------|------------|------------|-------------|
| Difficulty (metastre) at point 11 menes | 76 W 16 | / x to /8 | 76 to 1/16 | 1,4 10 1,78 |
| | | | | |
| Morse Taper Shanknumber | 1 1 | 1 2 | 1 3 | 1 .1 |
| Money Tuper Shank | | , ~ | | 1 = |

Special sizes made to order at special prices.

MORSE BRIDGE REAMERS

STRAIGHT REAMERS, TAPER ENDS

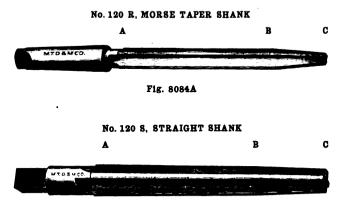


Fig. 8084B

For boiler makers, bridge and ship builders. These reamers are designed for hard and rough work and are not ground closely to size.

These reamers from $\frac{1}{4}$ -inch to $\frac{5}{8}$ -inch inclusive have 4 flutes; from $\frac{11}{4}$ inches inclusive have 5 flutes and from $\frac{15}{6}$ to $\frac{11}{2}$ inches inclusive have 6 flutes.

| DIAMETER State DIAMETER D | Length Taper 1 1 1 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 |
|--|--|
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | |
| | $egin{smallmatrix} 2 \\ 2 \\ 3 \end{bmatrix}$ |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3 3 3 3 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3 3 3 |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3 3 3 3 3 3 3 3 |

MORSE THREE-GROOVE CHUCKING REAMERS

No. 120 F: MORSE TAPER SHANK



| Die. | | 9 | 3 | ^ | • |
|------|---|---|---|---|---|
| | r | | а | u | ^ |

| _ | | | Fig | . 33UA | | | |
|--|---|------------------------------|------------------------|---|-----------------------|---|-----------------------------|
| Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diameter Inches | Price Each | Length Over All Inches | Twist Cut Inches |
| 14 | 1.70 | 61 8 | 3 | 1 312 | 7.65 | 151/2 | 97/8 |
| 2 | 1.70 | 617 | 213/2 | 1_{16}^{32} | 7.90 | 1531 | 1018 |
| 372 516 | 1.70 | 63 \$ | 316 | 1 3 3 | 8.15 | 1534 | 911 |
| 11 | 1.70 | 612 | 33 ₁₆ | 134 | 8.40 | 16 | 915 |
| 3 2 | 1.70 | 6^3 | 37/6 | 1 33 | 8.60 | 16 | 9u\2 |
| ĺš | 1.75 | 7 * | 311 | 1^{3}_{6} | 8.80 | 1614 | 101/8 |
| 7.4 | 1.80 | 71. | $3^{15_{16}^{16}}$ | 1 3 2 | 9.00 | 161 | 1018 |
| 3 / 407 / 100 / 10 | 1.85 | $71\frac{7}{2}$ | 43/16 | 178 | 9.20 | 161/2 | 1038 |
| 1/2 | 1.90 | 734 | 172 | 1 38 | 9.35 | 1612 | 103 \$ |
| ĄĀ | 1.95 | 8 | 411/16 | 1 13 7 | 9.50 | 161/2 | 101 |
| 974 | 2.00 | 814 | 415 | 1 3 2 | 9.65 | 1612 | 101 |
| 48 | 2.30 | 81/2 | 45 | 2 | 9.80 | $16^{\frac{1}{2}}_{2}$ | 101 |
| 5 8 21 32 | 2.60 | 834 | 478 | 2 1 | 10.20 | 1612 | 91,3 |
| 31 | 2.70 | 9 | 5î ç | 21/2 | 10.60 | 17 | 10 |
| 11 16 | 2.75 | 91, | 53 3 | $2\frac{3}{2}$ | 10.90 | 17 | 10 |
| áź | 2.85 | $91\frac{1}{2}$ | 55% | $2\mathbb{L}_8$ | 11.20 | 17 | 10 |
| 3 4 | 2.90 | 93 🖟 | $57\frac{\circ}{8}$ | 2 😤 | 11.60 | 17 | 10 |
| 38 | 3.00 | 97, | 6 | 28/6 | 12.00 | 17 | 10 |
| 13 | 3.05 | 10 | 61_8 | $2\frac{i}{32}$ | 12.40 | 171/2 | 101/2 |
| 27 | 3.15 | 10^{1}_{4} | 6^{3}_{8} | $\frac{5_{14}^{32}}{4}$ | 12.80 | $171\frac{7}{2}$ | 101.3 |
| 277 72 739 732 | 3.20 | 10^{1}_{2} | 65ζ | 2.8 | 13.20 | 171/2 | 101 6 |
| 32 | 3.30 | 10^{5} s | 6^{3}_{4} | $2^{\frac{3}{16}}$ | 13.60 | 171/2 | 101,8 |
| 15,16 | 3.40 | 1034 | 61 6 | 211 | 14.00 | 18 | $10^{5}\stackrel{\circ}{8}$ |
| 312 | 3.50 | $10^7\mathrm{s}$ | $61\frac{\circ}{4}$ | $\bar{2}^{3}$ | 14.40 | 18 | 10ին |
| 1 | 3.60 | 11 | 6^3 s | 213 | 14.70 | 181_{2} | 11 |
| $\frac{1}{3}\frac{d}{d}_2$ | 3.70 | 1118 | 61_2 | 27 ₁₆ | 15.00 | $18\frac{1}{2}$ | 11 |
| 1116 | 3.80 | 1114 | 65 | 2 13 | 15.30 | 19 | $11\frac{1}{2}$ |
| 1 42 | 3.90 | $111\frac{1}{2}$ | $67 \mathrm{s}$ | $21\frac{1}{2}$ | 15.60 | 19 | 1138 |
| 118 | 4.00 | 1134 | $71\frac{2}{8}$ | $23\overline{5}$ | 15.90 | 1914 | 115/8 |
| 1 32 | 4.25 | 117_8 | 7^{14} | 2°_{16} | 16.20 | 1914 | 11^{5} s |
| 1316 | 4.50 | 12 | 73_{8} | 233 | 16.50 | 191/2 | 117_{8} |
| $\frac{1}{3}\frac{7}{3}$ | 4.65 | 121 × | $7\frac{1}{2}$ | 208 | 16.80 | 1912 | 11^{3} |
| 1 | 4.80 | 1212 | $\frac{77.5}{2.5}$ | $2\frac{1}{3}$ | 17.35 | 20 | 1214 |
| 1_{32} | 5.00 | 141 8 | $\frac{81}{2}$ | 211 ₁₆ | 17.90 | 20 | $12^{1}\frac{1}{4}$ |
| 1 5 16 | 5.20 | 141, | 85 s | 253 98 | 18.45 | 201/2 | 1234 |
| 132 | $\begin{array}{c} 5.35 \\ 5.60 \end{array}$ | 143 | $\frac{8^{3}}{6^{-4}}$ | 234 | 19.00 | 201/2 | $\frac{12^5}{8}$ |
| 1" q 1 13 | | $\frac{14^{1}}{2}$ | $\frac{87}{9}$ s | 233 | 19.50 | 201/2 | 125 |
| 1 43 1 7 ₁₆ | 5,80 6,00 | 145 8 | 9 91. | $\frac{2^{15}_{16}}{2^{23}_{33}}$ | 20.00 | 201/2 | $12^{5}\frac{1}{3}$ |
| 1 16 1 15 | 6.20 | $\frac{143}{147}_{8}$ | 914 | 232 | $\frac{20.50}{21.00}$ | 21 | 1318 |
| $\frac{1}{1}$ | 6.40 | 15' s 15 | 914 | 278 | $\frac{21.00}{22.00}$ | $\begin{array}{c} 21 \\ 21 \end{array}$ | 13 13 |
| $\frac{1}{1}\frac{7}{3}\frac{2}{3}$ | 6.65 | 15 15 | 93 (| $\frac{2\frac{35}{35}}{2^{15}}$ | $\frac{22.00}{23.00}$ | $\frac{21}{21}$ | 13 |
| 1916 | 6.90 | 151 | 9°_{8} | 4"]6 931 | $\frac{25.00}{24.00}$ | $\frac{21}{22}$ | 13 14 |
| 1 1 2 | $\frac{0.50}{7.15}$ | 151 | 9°8 95° | $\frac{235}{3}$ | $24.00 \\ 25.00$ | 22 22 | 137 s |
| $1^{\frac{1}{3}}_{\frac{3}{8}}$ | 7.40 | 151 3 | 97. | • | <i>≟0</i> , 00 | ئيت | 10.8 |
| | | 2 2 | •• < | | | | |

ABOVE REAMERS HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive) inches | $^{1}_{4}$ to $^{9}_{16}$ | 21 to 23 | 59 to 114 | 11; to 2 | $2\frac{1}{32}$ to 3 |
|------------------------------|---------------------------|----------|-----------|----------|------------------------|
| Morse Taper Shank number | | 2 | 3 | 4 | 5 |

MORSE THREE-GROOVE OR CHUCKING REAMERS

FOR SCREW OR CHUCKING MACHINES
NO. 120 FB. STRAIGHT SHANKS



| | | | | | Fig. | 683A | | | | | |
|--|--|--|--|---|--|---|---|--|--|--|-----------------------------------|
| Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Shank Inches | Length Shank Inches | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | Diam. Shank Inches | Length Shank Inches |
| Inches 1.02.642.842.662.272.662.842.662.465.842.662.465.842.642.662.465.842.842.842.842.842.842.842.842.842.842 | | Over All Inches 61/8 61/4 63/8 61/2 63/4 7 71/4 71/2 73/4 8 81/4 81/4 81/4 91/2 91/2 91/2 91/2 91/2 91/4 | Cut Inches 37/8 4 1/8 4 1/4 4 1/4 5 5 1/4 5 5 1/4 5 5 3/4 6 6 1/4 6 6 1/4 7 1/ | Shank Inches 144 4 4 4 4 8 8 8 8 8 8 1 2 2 2 2 2 2 2 2 2 2 2 2 2 | Shank Inches 11/2 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | Over All Inches 15½ 15¾ 16 16 16 16 16 16 16 16 16 16 16 16 16 | Cut | Shank Inches 1 1/4 1 1/ | Shank Inches 3 |
| 1 13 1 74 | 5.35 5.60 5.80 6.00 6.20 | 143.8 141.2 145.8 143.4 147.8 | $10^{5}\%$ $10^{3}\%$ $10^{7}8$ 11 | 11 ₄ 11 ₄ 11 ₄ 11 ₄ | 1 3 3 3 3 3 | 1 2 3 4 5 2 3 3 2 3 3 2 3 3 3 3 3 3 3 3 3 3 3 3 | 19.00 19.50 20.00 20.50 21.00 | $ \begin{array}{c c} 201_{2} \\ 201_{2} \\ 201_{2} \\ 21 \\ 21 \end{array} $ | 15 14^{1}_{2} 14^{1}_{2} 15 14^{7}_{8} | $1\frac{1}{2}$ $1\frac{3}{4}$ $1\frac{3}{4}$ $1\frac{3}{4}$ | 312 4 4 4 4 4 4 |
| 1 1 2 1 1 2 1 1 2 1 2 1 2 1 2 1 3 2 1 3 2 3 3 3 3 | $egin{array}{c} 6.40 \\ 6.65 \\ 6.60 \\ 7.15 \\ 7.40 \\ \end{array}$ | 15 15 15 15 15 15 15 15 | $\begin{array}{c} 111_{4} \\ 111_{4} \\ 111_{2} \\ 111_{2} \\ 111_{3} \end{array}$ | 11 ₄ 11 ₄ 11 ₄ 11 ₄ 11 ₄ | 3 3 3 | $2^{rac{28}{32}}_{16} \ 2^{rac{31}{16}}_{32} \ 3$ | 22.00 23.00 24.00 25.00 | 21 22 | 147_8 147_8 157_8 153_4 | $ \begin{vmatrix} 13_{4} \\ 13_{4} \\ 13_{4} \\ 13_{4} \end{vmatrix} $ | 4 4 4 4 |

These reamers are especially adapted for enlarging cored holes and have shank and fluted portion ground on center to size.

Special lengths made to order at special prices.

MORSE THREE-GROOVE CHUCKING REAMERS

WITH HOLES THROUGH SOLID METAL FOR LUBRICANT

No. 120FC, MORSE TAPER SHANK



Fig. 682A

No. 120FF. MORSE TAPER SHANK



Fig. 682B

| $ \begin{array}{c c c c c c c c c c c c c c c c c c c $ | | | | | | - 18. 0 | | | | | | |
|---|-------------------------|--|---|---|---------------------------------------|---|---|---|--|--|---|--|
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | Diameter Inches | Price Each | Length Over All Inches | | , | Price Each | Length Over All Inches | Length Twist Inches | | Price Each, | Length Over All Inches | Length Twist Inches |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 757, 1502, 277, 1602, 8 | 2.75 2.85 2.85 2.85 2.95 3.00 3.45 4.15 4.35 4.60 4.70 4.89 5.50 6.40 6.75 6.95 | 634 71,442,74 71,442,74 81,422,4 81,422,4 91,422,4 10,10,2,8 10,10,2,8 11,2,8 11,2 | 366 6 6 6 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 7.40 7.80 8.10 8.40 9.00 9.30 9.60 10.03 10.75 11.10 11.85 12.25 12.60 12.90 13.50 14.05 14.25 14.80 14.85 15.70 | 141 x 141 4 143 x 141 2 x 145 x 145 x 145 x 155 x 155 x 155 x 155 x 156 x 166 | 812 85 k 834 878 91 k 91 k 91 k 91 k 95 k 97 k 97 k 97 k 91 k 101 k 103 k 101 | 12222222222222222222222222222222222222 | 16, 80 17, 40 17, 95 18, 50 19, 00 19, 60 20, 15 20, 60 21, 45 21, 85 22, 30 23, 50 24, 25 25, 00 26, 60 27, 30 28, 70 29, 40 30, 80 32, 20 33, 60 | 17 171/2 171/2 171/2 171/2 171/2 171/2 171/2 181/2 181/2 181/2 191/4 191/2 191/2 201/2 201/2 21 21 21 21 22 | 10 10 ¹ / ₂ 10 ¹ / ₈ 10 ¹ / ₂ 11 11 11 ¹ / ₂ 11 ³ / ₈ 11 ⁵ / ₈ 11 ⁵ / ₈ 11 ⁵ / ₈ 12 ¹ / ₄ 12 ³ / ₄ 12 ⁵ / ₈ 12 ⁵ / ₈ 13 ¹ / ₈ |

Reamers are furnished in 64th sizes and take price of the next larger size listed.

ABOVE REAMERS HAVE MORSE TAPER SHANKS AS FOLLOWS

| + | | | | | |
|-----------------------------|------------------------|----------------|-----------|----------|---------|
| Diameters (inclusive)inches | 3 , to 9 ₁₆ | 37 to 32 | 59 to 114 | 117 to 2 | 24 to 3 |
| Morse Taper Shanknumber | | $\overline{2}$ | 3 | 4 | 5 |

MORSE THREE-GROOVE CHUCKING REAMERS WITH HOLES THROUGH SOLID METAL FOR LUBRICANT

No. 120FE STRAIGHT SHANKS





| | | | | | Fig. (| 378B | | | | | |
|---------------------------------------|---------------|------------------------------|-------------------|---|---------------------------------|--|---------------|--|---------------------------------|---|----------------------------|
| Dlam. Inches | Price Each | Length Over All Inches | | Diam. Shank Inches | Length Shank Inches | Diam. Inches | Price Each | Length Over All Inches | Twist Cut Inches | | Length Shank Inches |
| 3 8 | 2.75 | 634 | 414 | 3 % | $-\frac{134}{134}$ | 133 | 12.25 | $15^{3}4$ | 12 | 114 | 3 |
| 13 | 2.75 | 7 | 41.2 | 3 3 | 13/ | 134 | 12.60 | 16 | 1178 | 114 | 3 |
| 7/6 | 2.85 | 714 | 43/4 | 3 3 | 13/ | 1 33 | 12.90 | 16 | 117. | 11. | 3 |
| 13 | 2.85 | 71/2 | 5 | 3,3 | 134 | 113. | 13.20 | 1614 | 121/8 | 11. | 3 |
| 132 7/16 152 1/2 | 2.85 | 73.7 | 5 | 1/2 | 2 * | 1 27 | 13.50 | 1614 | 1218 | 114 | 3 |
| 17 32 96 | 2.95 | 8 | 514 | 1/2 | $\frac{2}{2}^4$ | $1\frac{7}{8}$ $1\frac{29}{52}$ | 13.80 | 161/2 | 1214 | 11. | 3 |
| 9,6 | 3.00 | 814 | 51/6 | 1/2 | $ar{2}$ | 1 38 | 14.05 | 161/2 | 1214 | $1\iota_4$ | 3 |
| 19 | 3.45 | 81.5 | $53\overline{4}$ | 3 8 8 8 8 8 8 8 1 1 2 2 2 2 2 2 2 3 5 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 | $\frac{5}{2}$ | 11/2 | 14.25 | 161/2 | 1217 | 11. | 3 3 3 3 3 3 |
| 19 5 8 | 3.90 | $83\frac{7}{4}$ | $5\frac{3}{4}$ | $=\hat{5}\hat{5}^{\dagger}$ | 217 | $1\frac{31}{32}$ | 14.50 | 161/2 | 1214 | 117 | 3 |
| 21 | 4.00 | 9 ~ | 6 | 5 8 5 8 5 8 | $ar{2} \hat{\imath}_4^*$ | $\overline{2}^{32}$ | 14.70 | 161/2 | 121/8 | $1\frac{1}{4}$ $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{1}{2}$ | 3 |
| 21 11 16 | 4.15 | 914 | $6\frac{1}{4}$ | 5 3 | $\overline{2}_{14}^{+}$ | $2\frac{1}{32}$ | 14.80 | 161/2 | 1134 | 11% | 31/2 |
| 23 | 4.25 | 91/2 | 61/2 | 5 3 | $\overline{2}_{1}$ | $\frac{2_{16}^{32}}{2_{16}}$ | 14.85 | 17 | 1214 | 11/6 | 31/2 |
| 3, | 4.35 | 934 | 634 | 3 7 | $\overline{2}$ | $\frac{1}{2}\frac{1}{3}$ | 15.30 | 17 | 1214 | 11% | $31\frac{2}{2}$ |
| 25 | 4.50 | 978 | 67/8 | 34 34 | 2_{17}^{4} | $12\overset{32}{1}\overset{32}{8}$ | 15.70 | 17 | 1218 | 11/2 | 312 |
| 13.4 | 4.60 | 10 | 7 8 | 34 | $\mathbf{\tilde{2}}_{14}^{14}$ | 2^{58}_{32} | 16.25 | 17 | 1218 | 112 | 314 |
| 27 | 4.70 | 1014 | 714 | 3.7 | $21\frac{1}{4}$ | 2_{16}^{32} | 16.80 | 17 | 1218 | $\frac{11_{2}}{11_{2}}$ | 31% |
| 2018/2013/1672/X | 4.80 | 1013 | 714 | 74 | $2\frac{7}{2}$ | $\begin{array}{c} 2 \stackrel{16}{} \\ 2 \stackrel{7}{} \end{array}$ | 17.40 | 171/2 | 125 8 | $1\frac{1}{2}$ | 312 |
| 29 32 | 4.95 | 105 8 | 73 8 | 3/4 3/4 7/8 7/8 | $\frac{272}{214}$ | $2^{\frac{32}{4}}$ | 17.95 | $ \cdot _{17\frac{1}{2}}^{17\frac{1}{2}}$ | 1212 | $1\frac{1}{2}$ | $3\frac{1}{2}$ |
| 1576 | 5.10 | 1034 | $7\frac{1}{2}$ | 7 % | $21\frac{2}{2}$ $21\frac{2}{2}$ | 9 9 | 18.50 | 1712 | $12\frac{1}{2}$ | 11/2 | 312 |
| 31 | 5.25 | 107 8 | $75\frac{2}{8}$ | 78 | $2\frac{1}{2}$ | $\frac{2\frac{1}{32}}{2^{5}}$ | 19.00 | 171/3 | $12\frac{1}{2}$ | $\frac{11_{2}}{11_{2}}$ | 312 |
| 1 32 | 5.40 | 11 | 71.2 | 1 1 8 | $2\frac{2}{3}\frac{2}{4}$ | $2\frac{2}{16}$ | 19.60 | $18^{\frac{117}{2}}$ | $13^{2/2}$ | 11/2 | 31/ |
| 11 | 5.55 | 111/8 | $\frac{152}{758}$ | i | $\frac{234}{234}$ | 232 | 20.15 | 18 | 1278 | $\frac{11_{2}}{11_{2}}$ | 21/ |
| $\frac{1\frac{1}{32}}{1\frac{1}{16}}$ | 5.70 | 1111 | 734 | 1 | $\frac{234}{234}$ | 913 | 20.13 | 181/2 | 133% | 11/2 | 21/2 |
| 1 16 | 5.85 | 111/2 | 8 | 1 | $\frac{234}{234}$ | 23 \\ 213 \\ 276 | 21.00 | | 13^{9}_{8} | 11/2 | 31/2 |
| $\frac{1}{1}\frac{3}{3}$ | 6.00 | 1134 | 814 | 1 | $\frac{234}{237}$ | 2 16 | 21.45 | $\begin{array}{c} 181\overline{2} \\ 19 \end{array}$ | 107 | $\frac{11}{2}$ | $3\frac{1}{2}$ |
| 11/8 | | 1178 | 83 8 | 1 | | $\frac{2\frac{15}{3}}{2!}$ | | | $13\frac{7}{8}$ | 11/2 | $3\frac{1}{2}$ |
| 1 32 | 6.40 | 11/8 | 01/8 | | $\frac{234}{334}$ | 21/2 | 21.85 | 19 | 1334 | 11/2 | $\frac{31}{2}$ |
| 1316 | 6.75 | 12 | 81/2 | 1 | $\frac{237}{4}$ | $2\frac{17}{3}$ | 22.30 | 1914 | 14 | 11/2 | $3\frac{1}{2}$ |
| $1\frac{7}{32}$ | 6.95 | 121 8 | 85 8 | 1 | $23\frac{7}{4}$ | 2976 | 22.70 | 191 | 14 | $1\frac{1}{2}$ | $3\frac{1}{2}$ |
| 114 | 7.20 | $12\frac{1}{2}$ | 834 | 114 | 3 | 238 | 23.10 | 191/2 | 141/4 | 11/2 | 31/2 |
| $1\frac{9}{32}$ | 7.40 | 141% | 103 8 | 114 | 3 | $\begin{bmatrix} 25\frac{2}{8} \end{bmatrix}$ | 23.50 | 1912 | 141/8 | 11/2 | $3\frac{1}{2}$ |
| 15/6 | 7.80 | 141_4 | 101/2 | 114 | 3 | $\frac{23\frac{1}{12}}{2^{11}}$ | 24.25 | 20 | 145 8 | $1\frac{1}{2}$ | $3\frac{1}{2}$ |
| 1 112 | 8.10 | 143 | 105 8 | 114 | 3 | 211/16 | 25.00 | 20 | 145 3 | $\frac{11_{2}}{11_{2}}$ | 31/2 |
| 13 6 | 8.40 | 141/2 | 1034 | 114 | 3 | $\frac{23\frac{9}{4}}{23\frac{7}{4}}$ | 25.80 | $20\frac{1}{2}$ | 1518 | 112 | $31\sqrt{2}$ |
| 1 13 | 8.70 | $145\frac{7}{8}$ | 10 s | 114 | 3 | 234 | 26.60 | 2012 | 15 | 11/2 | $3\frac{1}{2}$ |
| 17% | 9.00 | $143\frac{2}{4}$ | 11 | 114 | 3 | $2\frac{43}{32}$ | 27.30 | | 141/2 | 134 | 4 |
| 1 37 | 9.30 | 1478 | 111/8 | 114 | 3 | $2\frac{35}{32}$ 2^{13} | 28.00 | $20\frac{1}{2}$ | 141/2 | 13/4 | 4 |
| $1\frac{1}{2}$ | 9.60 | 15 | 1114 | 117 | 3 | 233 | 28.70 | 21 | 15 | 13/4 | 4 |
| 1 17 1 9 1 18 1 18 | 10.00 | 15 | 111/4 | 114 | 3 | 274 | 29.40 | | 147/8 | 13/4 | 4 |
| 1% | 10.35 | 1514 | 111/2 | 114 | 3 | 233 | 30.80 | | $14\frac{7}{8}$ $14\frac{7}{8}$ | 13/ | 4 |
| 1 1 3 2 | 10.75 | 1517 | 111/2 | 114 | 3 | 215% | 32.20 | | 147% | 134 | 4 |
| 15% | 11.10 | $15\frac{1}{2}$ | 1134 | 114 | 3 | 233 | 33.60 | 22 | $15\frac{7}{8}$ | 13/4 | 4 |
| 134 | 11.50 | $15\frac{1}{2}$ | 1134 | 114 | 3 | 3 | 35.00 | 22 | 153/4 | 134 | 4 |
| 111/16 | 11.85 | $-153	ilde{4}$ | 12 | -10^{-4} | 3 | | ١ | ٠ | | ٠ | |
| | | | | | | | | | | | |

Reamers are furnished in 64th sizes and take price of the next larger size listed.

MORSE SHELL REAMERS

No. 117 SHELL REAMER

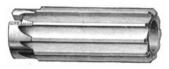


Fig. 6269A

No. 117A ROSE SHELL REAMER

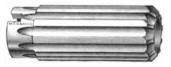


Fig. 6269B

No. 11712-SHELL REAMER SPIRAL FLUTES



Fig. 6269C

Shell reamers have taper holes, the diameter given being at the large end. Reamers Style No. 117A have no radial clearance but are ground with a longitudinal clearance.

| : | | | | | _ | | | . — _ | | | |
|---|---------------------|----------------------------|--------------------------|--------------------------------|-----------------------|--------------------|---------------------------|-----------------------------|-----------------------|-----------------------|--|
| Diam. | Price | Length Over All | Size Hole | Diam. | Price | Length Over All | Size Hole | Dam. | Price | Length Over All | Size Hole |
| Inches | Each | Inches | Inches | Inches | Each | | Inches | Inches | Each | Inches | Inches |
| $-\!$ | 1.40 | 2 | 1, | 21,6 | 5.40 | 3^{3}_{4} | 1^{1}_{4} | $3^{5}\mathrm{s}$ | 14.00 | 5 | 2 |
| 916 | 1.50 | 2 | 1, | 21 8 | 5.60 | 334 | 1^{1} | 311,6 | 14.50 | 5 | 2 |
| 5 . | 1.60 | 2^{1} | 3 8 | 2316 | 5.80 | 33_{4} | 1^{1}_{4} | 3^{3} . | 15.00 | 5 5 | 2 |
| 11 16 | 1.60 | 21 | 3 8 | 217 | -6.00 | 33 | 114 | 313,6 | 15.50 | 5 | 2 |
| 34 | 1.60 | $2!\frac{5}{2}$ | $\frac{1}{1}\frac{2}{2}$ | 2^{5}_{16} | 6.20 | 33, | 1^{1}_{4} | 37_{8} | 16.00 | 5 | 2 |
| 13 7 8 | 1.60 | 212 | $^{1}\overline{2}$ | 2^{3} \downarrow | 6.40 | 33_4 | 11, | 315/16 | 17.00 | 5 5 | $\frac{5}{2}$ |
| 7 s | 1.70 | 2^{1}_{2} | 1 2 | 27_{16} | 6.60 | 33. | 11, | 4 | 18.00 | 5 | 2 |
| 15 ² 16 | 1.70 | 21/2 | $\frac{1}{2}$ | $2^{1}\frac{1}{2}$ | 6.80 | $3^{3}\frac{7}{4}$ | 114 | 4 1 ₁₆ | 18.30 | 5!2 | $2^{1}4$ |
| 1 | 1.80 | $2^{3}\frac{1}{4}$ | 5 8 | 2^{9}_{16} | 7.00 | 4 | 112 | 418 | 18.60 | $5\frac{1}{2}$ | 214 |
| 1 16 | 1.80 | 2^3 | 5 s | 2^{5} , | 7.30 | 4 | 1^{1}_{2} | 4316 | 19.00 | $51\frac{7}{2}$ | $\frac{21}{4}$ |
| 118 | 1.90 | $\frac{2^{3}}{4}$ | $\frac{5}{8}$ | 2^{11}_{16} | 7.60 | 4 | $1\frac{1}{2}$ | 414 | 19.40 | $51\overline{2}$ | 214 |
| $\frac{18}{106}$ | 2.00 | 234 | 5 8 | 234 | 8.00 | 4 | 1^{1}_{2} | 4516 | 19.80 | 512 | 214 |
| $\frac{11}{114}$ | 2.20 | $\frac{2^3}{3}$ | $\frac{5}{8}$ | 2^{13}_{16} | 8.40 | 1 | 11.5 | 43 | 20.20 | $51\frac{7}{2}$ | 214 |
| 1516 | 2.40 | 3 | $\frac{3}{3}4$ | $27\frac{\circ}{8}$ | 8.80 | 4 | 1^{1}_{2} | 476 | 20.60 | $51\frac{7}{2}$ | 214 |
| 1^{3} | 2.60 | 3 | $\frac{3}{5}\frac{2}{4}$ | $\frac{2^{15}}{9}$ | 9.20 | 4 | 112 | $\frac{41}{2}$ | 21.00 | $\frac{5\sqrt{5}}{2}$ | $\frac{21}{91}4$ |
| 1716 | 2.80 | 3 3 | $\frac{3}{2}4$ | 3 | 9.60 | 4 | 111/2 | 4916 | 21.60 | 6 | 21.2 |
| $\frac{11}{2}$ | 3.00 | 3 3 | 34 | $\frac{31}{6}$ 16 | 9.10 | 412 | $\frac{13}{13}4$ | 45 Ç | 22.20 | 6 | ~~2 |
| $\frac{19}{15}$ 16 | 3.20 | . 3 3 | 3 4 | 315 | 10.20 | 412 | 134 | 411 16 | 22.80 | 6 | 21.3 |
| 15 8 | $\frac{3.50}{3.80}$ | 0 917 | 34 | $\frac{33}{316}$ | 10.60 | 413 | $\frac{13}{4}$ | 43 4 | $23.40 \\ 24.00$ | 6 | 262 |
| $\frac{1}{13}^{16}$ | 4.10 | $\frac{31}{2}$ | 1 | 314 | $\frac{11.00}{11.50}$ | $\frac{41}{41}$ | $\frac{13}{13}$ | 413 / 16 | $\frac{24.60}{24.60}$ | 6 | 212 |
| $\frac{13}{113}$ | 4.40 | 31/2 | 1 | $\frac{3^{5}}{3^{3}}$ | 12.00 | -/ - | | 47 g | $\frac{24.00}{25.20}$ | , 6 | $\frac{2\mathbb{L}_2}{2\mathbb{I}}$ |
| $\frac{1^{13}_{16}}{178}$ | 4.70 | $\frac{31\sqrt{2}}{31}$ | 1 | | 12.50 12.50 | 1 7.2 | $\frac{13}{13}4$ | $\frac{4}{5}$ $\frac{1}{6}$ | 26.00 | 6 | $rac{2 \mathfrak{l}_2}{2 \mathfrak{l}_2}$ |
| 115 | 5.00 | | 1 | $\frac{37}{21}$ 16 | 13.00 | _ | $\frac{1^{3}}{1^{3}}$ | J | 20.00 | 1 0 | 272 |
| $\frac{1}{2}$ | 5.20 | $\frac{3!}{3!}\frac{2}{2}$ | 1 | $\frac{3^{1}_{2}}{3^{9}_{16}}$ | 13.50 | $\frac{4}{5}$ | $\frac{13\frac{7}{4}}{2}$ | • • • • | • • • • • | • • | |
| | | 0.2 | 1 | -0.16 | 10,00 | 1 - 9 - | - | -··- | _ :- :- | :- | |

ONE-LOCK REAMER BLADES AND ARBORS

EXTRA BLADES FOR RENEWAL

| Diameter | PRICE PER SET | | | | | | |
|---|------------------------|----------------------------|--|--|--|--|--|
| Reamer Inches | Carbon Steel Blades | High Speed Steel Blades | | | | | |
| 31 | 2.80 | 4.00 | | | | | |
| 132 | 2.80 | 4.00 | | | | | |
| 7/8 | 2.80 | 4.00 | | | | | |
| 3 4 18/6 7/8 15/6 | 2,80 | 4.00 | | | | | |
| 1 " | 2.80 | 4.00 | | | | | |
| 114 | 2.89 | 4.10 | | | | | |
| 11% | 2.80 | 4.20 | | | | | |
| 116 118 138 114 156 138 176 1196 1196 1158 | 2.80 | 4.30 | | | | | |
| 112 | 2.80 | 4.40 | | | | | |
| 15/ | 2.85 | 4.50 | | | | | |
| 132 | 2.90 | 4.60 | | | | | |
| 178 177 | 2.95 | 4.70 | | | | | |
| 1/16 | 3.00 | 4.80 | | | | | |
| 12/2 | 3.05 | | | | | | |
| 1516 | | 4.90 | | | | | |
| 198 | 3.10 | 5.00 | | | | | |
| 1''/6 | 3.15 | 5.10 | | | | | |
| 134 | 3.20 | 5.20 | | | | | |
| 1136 | 3.30 | 5.30 | | | | | |
| 134 1 ¹³ 6 178 | 3.40 | 5.40 | | | | | |
| $\frac{1}{2}$ 16 | 3.50 | 5.50 | | | | | |
| 2 | 3.60 | 5.60 | | | | | |
| 21/6 | 3.70 | 5.75 | | | | | |
| 21/8 23/6 21/4 25/6 23/8 27/6 | 3.80 | 5.90 | | | | | |
| $2\frac{3}{16}$ | 3.90 | 6.05 | | | | | |
| 21/4 | 4.00 | 6.20 | | | | | |
| 25% | 4.10 | 6.35 | | | | | |
| 23 8 | 4.20 | 6,50 | | | | | |
| 27/4 | 4.30 | 6.65 | | | | | |
| 21.2 29.6 25.8 | 4.40 | 6.80 | | | | | |
| $\bar{2}$ | 4.50 | 6.95 | | | | | |
| 25 6 | 4.60 | 7.10 | | | | | |
| $\mathbf{\bar{2}}$ \mathbf{n}_{6}^{2} | 4.70 | 7.25 | | | | | |
| $\frac{2^{3}4}{4}$ | 4.80 | 7.40 | | | | | |
| 2132 | 4.90 | 7.55 | | | | | |
| 213/6 27/8 215/6 | 5.00 | 7.70 | | | | | |
| 2 ′ 8 915 ′ | 5.10 | | | | | | |
| 376 | | 7.85 | | | | | |
| | 5.20 | 8.00 | | | | | |

NUMBER OF BLADES

| Diameters | inches 34 to 23/6 | 21/1 to 3 |
|------------------|-------------------|-----------|
| Number of Blades | | |

ARBORS FOR ONE-LOCK REAMERS

| Number | 1 | 2 | 3 | 4 | 5 | 6 |
|---------------------------|------------|-----------|-------------|--------------|--------------|-----------|
| For Reamer Diameterinches | 34 to 13/6 | 1 to 13/6 | 11/1to 11/6 | 13/4 to 23/5 | 21/4 to 21/4 | 23/4 to 3 |
| Price, Machine Sharkeach | 1.00 | 1.25 | 1.50 | 2.00 | 3.00 | 4.00 |
| " Morse Taper Shank " | 2.50 | 3.00 | 3.50 | 4.50 | 5.00 | 7.00 |

In ordering blades, state size of reamer, and also length of shell, and whether carbon or high speed steel is wanted.

Blades can be supplied only in sets.



ONE-LOCK ADJUSTABLE REAMERS

CAM ADJUSTMENT OF ALL BLADES AT ONCE

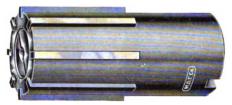


Fig. 5797A

All blades bear full length on the hardened and accurately ground cam faces of the cam bolt, which fits in the bored and slotted shell as shown in illustration below. Turning the cam bolt in the shell by the slotted head, moves all blades at once and all exactly alike, outward from the center. When the desired diameter is reached, the lock nut is tightened, with the special socket-adjusting wrench, so as to hold blades firmly on cam bolt, by means of the angular lug on each blade. The reamer is then ready for use.

ACCURATE ADJUSTMENT WITHOUT RE-GRINDING

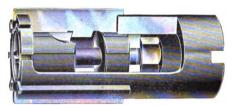


Fig. 5797B

Exact adjustment is quickly made to any size within wide range, without re-grinding blades, because all adjusting parts have bearing surfaces accurately ground after hardening. Re-grinding blades to exact size costs .50 to 2.00 in the average shop. The One-Lock saves this expense many times over, and maintains standard sizes at practically no cost. Blades last long, because range of adjustment is wide and no stock is wasted by re-grinding. Every set of blades in the One-Lock outwears at least ten solid reamers. When dull, grind only until sharp, then adjust to size. The reamer is provided with centers, for this purpose. Tampering with adjusted sizes is prevented, by keeping in authorized hands the special socket-adjusting wrench furnished with every reamer.

There is nothing to get out of order. Only three parts besides blades. One movement operates all blades at once and one nut locks them. It is a solid, rigid reamer.

Part of the reamer is cut away in Fig. 5797B to show the simple construction and the method of adjusting and locking the blades. The shell is one piece, bored and slotted to receive the cam bolt, blades and locknut,

The One-Lock Reamer can be adjusted larger or smaller with equal facility. The blades have no endwise movement in the shell, and can always ream to the bottom of a blind hole.

The cam bolt, with the lock nut, has its cam faces hardened and ground exactly alike. The reamer blades have full length bearing on these cam faces.

The range of adjustment, or amount of possible increase from the minimum cutting diameter of blades is determined by the drop of these cams.



ONE-LOCK ADJUSTABLE REAMERS

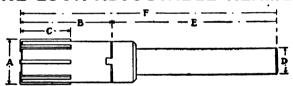


Fig. 7259A

| Diameter . | Extreme Length | Length of | PRICE WITHOUT EAC | OUT ARBOR, |
|--|---|---|------------------------|----------------------------|
| Inches | With Arbor Inches | Blade Inches | Carbon Steel Blades | High Speed Steel Blades |
| 3/ | 97/16 | 118 | 6,00 | 7.00 |
| 13% | 972 | 1 14 | 6.00 | 7.00 |
| 34 15/16 7/8 15/16 | 97/6 97/6 | $\frac{1}{3}\frac{15}{25}$ $\frac{1}{3}\frac{15}{25}$ | 6.00 | 7.00 |
| 15% | 97% | 1 115 | 6.00 | 7.00 |
| 1 1 1 | 97% 10% 10% | 1 ii | 6.00 | 7.00 |
| | 10% | 1 1 1 | 6.00 | 7.00 |
| 11/6 11/6 13/6 13/6 13/8 13/6 11/2 11/6 11/6 | 109% | 1 12 | 6,00 | 7.25 |
| 13/ | 10% 10% | 1 12 | 6.00 | 7.50 |
| 11/2 | 1196 | 1 15 | 6.00 | 7.62 |
| 15/ | 1196 | 115 | 6.30 | 7.96 |
| 13/ | 1196 | 115 | 6.60 | 8.30 |
| 17/8 | 1196 | 115 | 6.90 | 8.64 |
| 11/ | 11% | 115 | 7.20 | 8.99 |
| 192 | 1196 | 115 | 7.50 | 9.33 |
| 15/6 | 11.66 | 116 | 7.80 | 9.67 |
| 19/8 | 1196 | 116 | 8.10 | 10.01 |
| 1.76 | 1196 | 1 18 | 8.40 | 10.36 |
| 134 | 12% 12% 12% 12% 12% 12% 12% | $\begin{array}{c} 2\frac{3}{16} \\ 2\frac{3}{16} \\ 2\frac{3}{16} \\ 2\frac{3}{16} \end{array}$ | 8.70 | 10.30 |
| 113/6 17/8 115/6 2 | 12% | 2 16 | | |
| 1/8 | 12% | 2 16 | 9.00 | 11.04 |
| 1.76 | 12% | 216 | 9.30 | 11.38 |
| 2 | 1296 | 2 18 | 9.60 | 11.73 |
| 21/6 | 1296 | 2 16 | 9.90 | 12.07 |
| 21/8 | 12_{16}^{9} | 2 % | 10.20 | 12.41 |
| 23/6 | 12% | $\frac{23}{16}$ | 10,50 | 12.75 |
| $2\frac{1}{4}$ | 139/6 | 253 | 10.80 | 13.27 |
| 25 % 23 % 27 % | 13% 13% 13% 13% | 25 g | 11.10 | 13.61 |
| 23/8 | 13% | $\frac{25}{8}$ | 11.40 | 13.95 |
| $2\frac{7}{16}$ | 13% | 2 5 $\frac{3}{8}$ | 11.70 | 14.29 |
| $2\frac{1}{2}$ | 13% | 25% | 12.00 | 14.64 |
| 212 296 | 13^{9}_{16} | 25/8 | 12.30 | 14.98 |
| 25/8 | 13% | 25 ₹ | 12.60 | 15.32 |
| 2116 | 13°16 13°16 13°16 13°16 | 2^{5} | 12.90 | 15.66 |
| $2\sqrt[3]{4}$ | 14 100 | 3 " | 13,20 | 16.01 |
| 2137 | 14^{7}_{16} | 3 | 13.70 | 16.55 |
| 27/8 | 14 % | 3 | 14.20 | 17.09 |
| 215% | 1476 | 3 | 14.70 | 17.63 |
| 215/16 3 | $14\frac{7}{16}^{12}$ | 25% 25% 25% 30 30 30 30 30 30 30 30 30 30 30 30 30 | 15.20 | 18.18 |

In ordering reamers always give the minimum size, specify style of arbor wanted, and whether blades are to be of carbon or high speed steel.

Socket adjusting wrench furnished with every reamer.

RANGE OF ADJUSTMENT, ONE-LOCK REAMERS

| Diametersinches | 34 to 156 | 1 to 13/6 | 1!4 to 1 | 76 11/2 to 15 | $_{ m i6}^{-1}$ 2 to $2^{ m H}_{ m i6}^{-1}$ | 2% to 3 |
|-----------------|-----------|-----------|----------------|---------------|--|---------|
| Rangeinches | 64 | .025 | $\frac{1}{32}$ | 3 | 1,6 | 64 |

MORSE CENTER REAMERS AND COUNTERSINKS

No. 120H, CENTER REAMERS STYLE No. 1 STYLE No. 2





Fig. 74A

Fig. 74B

| | | ER DOZEN | Price | Еасн | Length Over All | Diameter Shank | Length Shank |
|------------|---------------------|---------------------|------------|------------|--------------------|-------------------|-----------------|
| Inches | No. 1 | No. 2 | No. 1 | No. 2 | Inches | Inches | Inches |
| 14 38 | $\frac{2.50}{2.90}$ | $\frac{2.90}{3.25}$ | .22 .25 | .25 .30 | 1½ 1¼ | 3 16 1/ | 3/4 7/6 |
| 1/2 5 2 | $\frac{3.25}{6.00}$ | 3.75 7.00 | .30 .50 | .35 .60 | 21/8 | 3/8 | 7/8 7/8 |
| 34 | 8.00 | 8.50 | .70 | . 75 | 23.8 | 1/2 | 1'8 |

Included angle 60°, other angles made to order. These reamers with included angle of 72 and 82° furnished at regular prices.

No. 109A, THREE GROOVE BIT STOCK COUNTERSINKS

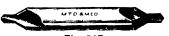


Fig. 74C

| Diameter Inch e s | Price Each | Length Over All Inches | Diameter Inches | Price Each | Length Over Ali Inches |
|-----------------------------|---------------|---------------------------|--------------------|---------------|---------------------------|
| 3 8 | .50 | 41,1 | 3/4 | .90 | 5 |
| 1/2 | .60 | 417 | 78 | 1.05 | 5 |
| 578 | . 75 | 4)4 | 1 | 1.20 | 5 |

Included angle of cutting point is 82°. Countersinks with other angles made to order at special prices.

No. 109B, COMBINED DRILLS AND COUNTERSINKS



| Fig. 7 | 4 D |
|--------|-----|
|--------|-----|

| Size Number | Diameter of Drill at | Approximate Fractional Equivalents | Price per Dozen | Diameter of Body nt (| Decimal Equivalents A B | Size Number | A B | Approximate Fractional Equivalent | Price per Dozen | Diameter of Body at C | Decimal Equivalents A B |
|----------------|----------------------|--|--------------------|--------------------------|-------------------------------|----------------|----------------------------------|---|--------------------|--------------------------|-------------------------------|
| 1 | 57 x 57 | 3 64 | 1.50 | 1 % | .043 x .043 | 9 | 30 x 30 | 1/8 | 1.50 | 340 | .128 x .128 |
| $2 \mid$ | 55 x 55 | | 1.50 | 13 | $.052 \times .052$ | 10 | 22 x 22 | 352 | 3.00 | 76 | .157 x .157 |
| 3 | 52×52 | 1/16 | 1.50 | 13 | .063 x .063 | 11 | 13 x 13 | 32 316 | 3.00 | 76 | $.185 \times .185$ |
| 4 | 49 x 49 | , | 1.50 | 15 | $.073 \times .073$ | 12 | 160 X 180 | | 1.50 | 15 | $.07 \times .08$ |
| 5 | 49 x 45 | ١ | 1.50 | 15 | $.073 \times .082$ | 13° | 64 X 64 | ١ | 1.50 | 32 | $.046 \times .046$ |
| 6 | 46 x 46 | 5 | 1.50 | 15 64 | .081 x .081 | 14 | $^{1}_{16} \times 45$ | | 1.50 | 13 | $.062 \times .082$ |
| 7 | 42 x 42 | 5 64 3 32 | 1.50 | 3 | $.093 \times .093$ | 15 | 3 ₁₆ x 3 ₂ | | 3.00 | 1/26 | $.187 \times .156$ |
| _8 | 42 x 30 | $\frac{3}{32}$ \times $\frac{1}{8}$ | 1.50 | 3 | $.093 \times .128$ | ١ | | | l | | |

Included angle 60°, other angles made to order at special prices.

MORSE COUNTERSINKS AND COUNTERBORES

No. 109C COMBINED DRILLS AND COUNTERSINKS No. 1 Morbe Taper Shank

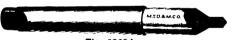


Fig. 6263A

| Size No. | Diam. of Drill Inches | Diam. of Body Inches | Price Each | Size No. | Diam. of Drill Inches | Diam. of Body Inches | Price Each |
|-------------|-----------------------------|----------------------------|-------------------|-------------|-----------------------------|----------------------------|---------------|
| 1 2 3 | 16 32 1/8 | 7 16 7 16 7 | .75 .75 .75 | 4 5 | 32 16 | 16 7 16 | . 75 . 75 |

No. 109D COUNTERBORES MORSE TAPER SHANK

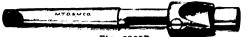


Fig. 6263B

| Diam. C'bore Inches | Diam. Guide Inches | Price Each | Length Over All Inches | C'bore | Diam. Guide Inches | Price Each | Length Over All Inches | Diam. C'bore Inches | Diam. Guide Inches | Price Each | Length Over All Inches |
|---------------------------|--------------------------|---------------|------------------------------|----------------|--------------------------|---------------|------------------------------|---------------------------|--------------------------|---------------|------------------------------|
| 3 8 | 1/4 | 1.40 | 4916 | 13/ | 1/2 | 1.50 | 53/6 | 11/4 | 7/8 | 2.00 | 65/6 |
| 7/6 | 516 | 1.40 | 4916 | ⁷ 8 | 916 | 1.80 | 61/6 | 156 | ⁷ /8 | 2.20 | 71/16 |
| 1/2 | 3/8 | 1.40 | 413/6 | 15/6 | 5/8 | 1.80 | 616 | 13/8 | 15/6 | 2.40 | 71/16 |
| 916 | 3/8 | 1.40 | 413/6 | 1 | 3/4 | 1.80 | 616 | 17/6 | 15/16 | 2.60 | 7176 |
| $\frac{5}{8}$ | 7/6 | 1.40 | 413/6 | 1 16 | 3/4 | 1.80 | 65/6 | 11/2 | 1 | 2.80 | 71/6 |
| 11/16 | 7/16 | 1.50 | 5^{3} 16 | 11/8 | 13/ | 2.00 | 65/6 | | • • • | | |
| 3/4 | 1/2 | 1.50 | 5^{3}_{6} | 13/6 | 13/16 | 2.00 | 65% | | ۱ | | |

ABOVE COUNTERBORES HAVE MORSE TAPER SHANKS AS FOLLOWS

| Diameters (inclusive)inches | $\frac{3}{8}$ to $\frac{13}{16}$ $\frac{7}{8}$ to $\frac{11}{4}$ $\frac{15}{16}$ to $\frac{11}{2}$ |
|-----------------------------|--|
| Morse Taper Shanknumber | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ |

NO. 109F COUNTERBORES, INTERCHANGEABLE BLADES AND GUIDES MORSE TAPER SHANK



Fig. 6263C

| | Price | Елен | CAPACITY | Capacity Inches | | | |
|-----|----------------------------|-----------------------------|-------------|---------------------|--------------------------|--|--|
| No. | Without Blade and Guide | With One Blade and Guide | Blades | Guldes | Taper Shank Number | | |
| 1 | 3.50 | 5.00 | 3/4 to 11/2 | 1 ₂ to 1 | 2 | | |
| 2 | 4.55 | 6.25 | 1 6 " 21 2 | 78 " 11/4 | 3 | | |
| 3 | 5.60 | 8.00 | 2 8 " 312 | 11,8 " 2 | 4 | | |

EXTRA BLADES AND GUIDES

| Extra | Price | Extra | Price | Extra | Price |
|--|-------------------|--|--------------------|--|-------------------|
| Blades, Inches | Each | Guides, Inches | Each | Guides, Inches | Each |
| 37 to 1 by 16ths 116 " 11/2 " " " 19/6 " 2 " " " | .75 .85 .95 | $\frac{2^{1}_{16}}{2^{9}_{16}} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{2^{1}_{2}}{3} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{16}{3} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{1}{3} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{1}{2} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{1}{2} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{1}{2} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{1}{2} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{1}{2} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \stackrel{\cdot}{\cdot} \frac{1}{2} \stackrel{\cdot}{\cdot} \stackrel$ | 1.25 1.65 1.85 | 12 to 1 by 16 ths 11/6 " 19/6 " " 15/8 " 2 " " | .75 .75 .85 |

MORSE COUNTERBORES

No. 109 K. MORSE TAPER SHANKS



Fig. 155A

No. 109L, STRAIGHT SHANKS



| Fig | . 1 | R | ĸΤ | |
|-----|-----|---|----|--|

| | | | | | | | | | | _ | _ | | _ |
|---|--|--|-------------------------------------|-----------------------|--|---|--|--|---|-------------------------|-----------------------|---|---|
| Screw Pitch rd | | DIAME COUNTI INC | TER OF ERBORE HES | ∣ G∵ | TER OF IDE HES | NIIV. | Screw Pitch rd | | DIAME COUNT INC | TER OF ERBORE HES | Gu | TER OF IDE THES | = |
| Diameter of Screw Inches, and Pitch U. S. Standard | Price Each | For Head of Screw | For Body of Serew | For Body Size Hole | For Tap Drill Hole | Length Over Inches | Diameter of Sc Inches, and P U. S. Standard | Price Each | For Head of Screw | For Body of Screw | For Body Size Hole | For Top Drill Hole | Length Over Inches |
| 14 · 20 14 · 20 14 · 20 15 · 18 16 · 18 16 · 18 16 · 18 16 · 18 16 · 16 17 · 16 · 14 17 · 16 · 12 18 · 16 · 12 18 · 16 · 12 19 · 16 · 12 10 · 12 11 · 12 12 · 13 13 · 16 · 12 14 · 12 15 · 16 · 12 16 · 12 17 · 16 · 12 18 · 16 · 12 18 · 16 · 12 19 · 16 · 12 19 · 16 · 12 10 · 16 · 12 10 · 16 · 16 · 16 · 16 · 16 · 16 · 16 · | 1.50 1.50 1.50 1.50 1.60 1.60 1.60 1.60 1.75 | 3 / 3 / 8 / 7/16 / 6 / 6 / 6 / 6 / 6 / 6 / 6 / 6 / 6 | 14 5/6 3 8 7/6 | 1.4 | .301 .301 .347 .347 .4057 .4057 | 534 534 534 618 618 612 612 77 714 714 714 714 | 5 8 11 11 11 11 10 11 3 4 10 3 4 10 3 4 10 3 6 10 7 8 8 9 9 1 16 9 1 16 9 | 2.10 2.10 2.20 2.20 2.20 2.30 2.30 2.40 2.40 2.40 2.40 2.40 2.40 | 15/6 15/6 11/6 1 1 1/6 1 1/8 1 1/8 1 1/8 1 1/8 | 5 8 | 11 16 | .5146 .5771 .5771 .624 .624 .6865 .6865 .7333 .7333 | 734 8122 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 |
| 26 12 26 12 26 11 28 11 | 1.75 1.75 2.00 2.00 | 13)6 | 9/6 16 | 5.8 | .452 .452 | $7\frac{1}{2}$ $7\frac{1}{2}$ $7\frac{3}{4}$ $7\frac{3}{1}$ | $egin{array}{cccccccccccccccccccccccccccccccccccc$ | 2.60 2.60 2.60 | 1!4 1!4 | 1 | | .8427 .8427 | 912 912 912 |

109K COUNTERBORES HAVE TAPER SHANKS AS FOLLOWS

| Diameters of Screw | s | inches | 1 ₄ to 3 ₈ | $\frac{7}{16}$ to $\frac{5}{8}$ | n to 1 |
|--------------------|---------------------------------------|--------|----------------------------------|---------------------------------|--------|
| Morse Taper Shank | · · · · · · · · · · · · · · · · · · · | number | 1 | 2 | 3 |

Counterbores given in the table above are furnished either singly or in sets. A set consists of one counterbore for head of screw with guide of body size, one counterbore for head with guide of tap drill size, and one counterbore to enlarge a tap drill hole to body size. Counterbores of other sizes are made to order at special prices.

LIGHTNING TAPER REAMERS, ETC.

FOR BIT BRACE USE



Fig. 110A

| Sizeinches | 1/4 | 1/6 | 8/8 | 7/6 | 1/2 | 9/6 | 5/8 | 11/6 |
|------------|-----|------|-----|------|-----|------|------|------|
| Price each | .45 | .50 | .55 | .60 | .70 | .80 | .90 | 1.05 |
| Sizeinches | 3/4 | 13/6 | 7/8 | 15/6 | 1 | 11/8 | 11/4 | |
| Price each | | | | | | | | |

WITH 12-INCH ROUND SHANKS



Fig. 110B

| Sizeinches | 1/4 | 5/16 | 3/8 | ₹ 6 | 1/2 | % | 5/8 | 11/16 |
|------------|------|------|------|------------|------|------|------|-------|
| Priceeach | .55 | .60 | .65 | .70 | .75 | .85 | 1.00 | 1.20 |
| Sizeinches | 3/4 | 13/6 | 7/8 | 15/6 | 1 | 11/8 | 11/4 | |
| Priceeach | 1.40 | 1.60 | 1.80 | 2.00 | 2.25 | 2.40 | 2.80 | |





Fig. 110D

| Diameter at Point Inches | Diameter at Large End Inches | Length of Flute Inches | For Pipe Inches | Price, with Bit Brace Shank Each | Price, Round Shank Each |
|--------------------------------|------------------------------------|------------------------------|--------------------|--|-------------------------------|
| 3/6 | 11/16 | 11/8 | 1/8 to 1/2 | 1.00 | 1.00 |
| % | 11/4 | 19/6 | 1/2 " 1 | 1.25 | 1.25 |
| 13/6 | 21. | 113% | 117 " 2 | 3 50 | 3.50 |

COUNTERSINK







Fig. 110E

Fig. 110F

COUNTERSINKS

| Price, 5%-inch, Bit Brace or Rd Shank, 1/2 or 11-inch, 60 or 80 d | legree angleeach .50 |
|---|----------------------|
| " 3/4-inch, same as above | |

| N | EM | CEI | NTE | | | ERS |
|-----|-----|-----|---------|-------|------------|------|
| 1.4 | L-W | GEI | N 1 E 1 | 4 M E | ΔM | E HS |

| Size Cutinch | es 1/4 | 3/8 | 1/2 | 5/8 | 34 |
|-----------------------------|--------|----------------|------------|-----|-----|
| Size Shank incl Price ea | | $\frac{1}{25}$ | 3/8 .35 | .50 | .60 |

MORSE ARBORS

No. 125

ARBORS FOR BEACH AND STETSON DRILL CHUCKS



Fig. 6272A

| Number | Price Each | Fitting Chuck Number | Length Over All Inches | Length of Shank Inches | Diameter of Shank Inches |
|----------|---------------|---------------------------------------|------------------------------|------------------------------|--------------------------------|
| 0 | .80 | 0 Beach | 43% | 33/8 | 1/2 |
| 1 | 1.00 | 1 Beach | 61/3 | 41/6 | H |
| 2 | 1.00 | 2 Beach, 2 Stetson and Stetson Geared | 61/2 61/2 613/6 | 41/2 | 3/8 |
| 3 | 1.20 | 3 and 4 Beach | 6137 | 41/2 | 1 |
| 4 | 1.50 | 3 and 4 Stetson | 71/2 | 47/8 | 11/4 |

No. 125½

ARBORS FOR BEACH AND STETSON DRILL CHUCKS WITH MORSE TAPER SHAWK



Fig. 62721

| Number | Price Each | Fitting Chuck Number | Length Over All Inches | Morse Taper Shank, Number |
|--------|---------------|---------------------------------------|----------------------------|------------------------------|
| U | 1.30 | 0 Beach | $-\frac{1}{35}\frac{1}{8}$ | 1 |
| 1 | 1.30 | 1 Beach | 41/2 | 1 |
| 1A | 1.40 | 1 Beach | 5^{3}_{16} | ${f 2}$ |
| 2 | 1.40 | 2 Beach, 2 Stetson and Stetson Geared | 5376 | ${f 2}$ |
| 2A | 1.75 | 2 Beach, 2 Stetson and Stetson Geared | 5136 | 3 |
| 3 | 1.75 | 3 and 4 Beach | 614 | 3 |
| 3A | 2.25 | 3 and 4 Beach | 71/4 | 4 |
| 4 | 2.00 | 3 and 4 Stetson | 61/2 | 3 |
| 4A | 2.50 | 3 and 4 Stetson | 7/2 | 4 |

No. 125B, ARBORS FOR SHELL END MILLS MORSE TAPER SHANK



Fig. 6272C

| | Number | Price Each | Fitting Sizes Inches | Morse Taper Shank Number |
|---|--------------|---------------|-------------------------|-----------------------------|
| _ | ₁ | 3.75 | 114 to 11/2 | 3 |
| | 2 | 4.00 | 116 " 237 | 4 |
| | 3 | 4.00 | 214 " 3 | 4 |

State whether arbors are desired for right or left hand mills.

MORSE ARBORS

No. 125D ARBORS FOR FACE MILLING CUTTERS WITH INSERTED TEETH



Fig. 423A

| No. | Price | Number of Taper | Length Over All | Length of Shank | Diam. of Shank |
|-----|-------|-----------------|--------------------------------|-----------------|----------------|
| | Each | for Mill | Inches | Inches | Inches |
| 1 2 | 7.50 | 10 | 10 ³ / ₈ | 77/8 | 15/8 |
| | 10.00 | 12 | 11 ⁷ / ₈ | 83/8 | 21/8 |

These arbors have one end blank to be fitted to lathe spindle.

NO.125E ARBORS FOR EXPANDING AND ADJUSTABLE SHELL REAMERS



Fig. 423B

| Number | Price Each | For Reamers Number | Fitting Sizes Inches | Length Over All Inches | Morse Taper End Number | Length Shank Inches | Diameter Shank Inches |
|--------|---------------|-----------------------|----------------------------|------------------------------|------------------------------|---------------------------|-----------------------------|
| 3 | 3.25 | 120M and 120N | 13 s to 15 s | 8156 | 2 | 51/2 | 7/8 |
| 4 | 4.00 | | 1116 " 214 | 101% | 3 | 5 3 2 2 | 11/8 |
| 5 | 6.00 | | 25% " 35% | 117% | 4 | 633 | 13/8 |
| 6 | 12.50 | | 338 " 438 | 143 8 | 5 | 731 | 2 |
| 7 | 17.50 | | 41/2 " 6 | 171/2 | 6 | 9 🖁 💈 | 25/8 |

Shanks on above arbors are ground standard to sizes listed.

No. 125F ARBORS FOR EXPANDING AND ADJUSTABLE SHELL REAMERS MORSE TAPER SHANKS



Fig. 423C

| Number | Price Each | | Rear | | Fitting Sizes Inches | Length Over All Inches | Morse Taper End Number | Morse Taper Shank Number |
|--------|---------------|------|------|------|-------------------------|------------------------------|------------------------------|--------------------------------|
| 3 | 4.75 | 120M | and | 120N | 13% to 15% | 815/16 | 2 | 3 |
| 4. | 5.50 | 66 | 66 | 44 | 111/6 " 21/4 | 101/16 | 3 | 3 |
| 5 | 7.75 | 46 | 64 | 66 | 25/6 " 35/6 | 117/8 | 4 | 4 |
| 6 | 14.50 | 66 | 66 | 66 | 33% " 43% | 143/8 | 5 | 5 |
| 7 | 19.50 | 44 | 64 | 44 | 41/2 " 6 | 171/2 | 6 | 6 |

MORSE ARBORS

No. 125A

FOR SHELL REAMERS No. 117, 1174 ROSE SHELL 117A AND SHELL DRILLS No. 102H

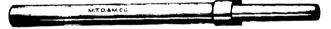


Fig. 6271A

| No. Price Each | Fitting Sizes Inches | Length Over All Inches | Length Shank Inches | Shank | No. | Price Each | Fitting Sizes Inches | Length Over Ail Inches | Length Shank Inches | Shank |
|--|---|---|--|--|--|---|-------------------------|--|---|--|
| 3 1.60 4 1.80 5 2.00 6 2.20 7 2.40 8 2.70 9 3.00 | 1 2 to 95 5/8 " 11/6 3/4 " 15/6 1 " 11/4 15/6 " 15/8 11/6 " 2 21/6 " 21/2 | 8 9 9 ¹ / ₂ 10 11 12 13 | $5\frac{1}{2}$ $6\frac{3}{3}$ $6\frac{1}{3}$ $6\frac{1}{3}$ $7\frac{1}{3}$ $7\frac{1}{3}$ $8\frac{1}{3}$ | 716 12 5 8 3 4 7 8 1 1 8 1 3 8 | 10 11 12 13 14 15 16 | 3.40 5.00 7.00 9.00 12.00 14.75 17.50 | | 14 15 16 17 18 19 20 | 8 37 9 35 9 35 9 35 10 16 10 9 16 11 16 | 15/8 21/8 21/8 23/8 25/8 31/4 |

Shanks on above arbors are ground standard to sizes listed.

No. 1254A ARBORS, MORSE TAPER SHANK

FOR SHELL REAMERS, No. 117, 11712; ROSE SHELL NO. 117A AND SHELL DRILLS No. 102H



Fig. 6271B

| Fitting Sizes Inches | Length Over All Inches | Morse Taper Shank Number | No. | Price Each | Fitting Sizes Inches | Length Over All Inches | Morse Taper Shank Number |
|-------------------------|-------------------------------|-----------------------------------|--|---|---|---|---|
| 1 2 to 16 | 8 | 1 | 10 | 4.90 | 2916 to 3 | 14 | 4 |
| ., S 16 | | 1 | | | | | 9 5 |
| 1 " 114 | 10 2 | $oldsymbol{ar{2}}$ | 13 | 10.75 | 416 " 412 | 17 | 5 |
| 156 " 158 | 11 | 3 | 14 | 14.00 | 496 " 512 | 18 | 6 |
| 1" ₁₆ " 2 | 1 ' | 3 | - 1 | | 5 ⁹ 16 " 6 ¹ ⁄2 | | 6 |
| | 1 2 to 16 5 8 11 15 16 1 11 4 | Titing Sizes Over All Inches | Fitting Sizes Length Over All Taper Shank Shan | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ | $ \begin{array}{ c c c c c c c c c c c c c c c c c c c$ |

No. 125C ARBORS, BLANK ENDS MORSE TAPER SHANK



Fig. 6271C

| Morse Taper Shank Number | Price Each | Length Over All Inches | Length of Blank End, Inches | Diam. of Blank End, Inches |
|--------------------------------|---|--|--------------------------------|-------------------------------|
| 1 2 | 1.50 1.50 | $\frac{3^{11}_{16}}{4^{3}_{8}}$ | $\frac{11_{8}}{11_{4}}$ | 11 kg |
| 3 4 5 | $egin{array}{c} 1.75 \ 1.75 \ 2.00 \end{array}$ | 53/8 65 ₈ 83 ² | 113 134 217 | 1 13/8 15/ |

MORSE HARDENED AND GROUND STEEL MANDRELS

No. 123

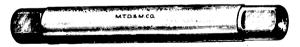


Fig 7409A

TAPERED .006 TO .010 OF AN INCH IN 12 INCHES

| Diameter Inches | Length Over All Inches | Price Each | Diameter Inches | Length Over All Inches | Price Each |
|--------------------|------------------------------|---------------|--------------------|------------------------------|---------------|
| 1/4 | 3¾ | . 65 | 23/16 | 12 | 6.00 |
| 5/16 | 4 | .75 | 21/4 | 12 | 6.50 |
| 3/8 | 41/4 | .85 | 25/16 | 12 | 6.90 |
| 7∕16 | 4½ | .95 | 28/8 | 12 | 7.40 |
| 1/2 | 5 | 1.05 | 27/6 | 12½ | 7.90 |
| % | 51/4 | 1.15 | 2½ | 12½ | 8.40 |
| 5/8 | 51/2 | 1.25 | 2% | 121/2 | 8.90 |
| 11/16 | 53/4 | 1.35 | 25/8 | 121/2 | 9.40 |
| 3/4 | 6 | 1.45 | 211/6 | 13 | 9.90 |
| 13/18 | 61/4 | 1.55 | 234 | 13 | 10.50 |
| 7 /8 | 61/2 | 1.70 | 213/6 | 13 | 11.00 |
| 15/16 | 63/4 | 1.85 | 27/8 | 13 | 11.50 |
| 1 | 7 | 2.00 | 215/6 | 13 | 12.00 |
| 11/6 | 71/4 | 2.10 | 3 | 13 | 12.50 |
| 11/8 | 7½ | 2.20 | 31/6 | 14 | 13.00 |
| 13/6 | 73/4 | 2.30 | 31/8 | 14 | 13.40 |
| 11/4 | 8 | 2.45 | 33/6 | 14 | 13.80 |
| 15/6 | 81/4 | 2.60 | 31/4 | 14 | 14.10 |
| 13/8 | 81/2 | 2.75 | 35/6 | 15 | 14.40 |
| 17/6 | 83/4 | 2.90 | 33/8 | 15 | 14.70 |
| 11/2 | 9 | 3.10 | 37/6 | 15 | 15.00 |
| 1% | 91/4 | 3.30 | 31/2 | 15 | 15.30 |
| 15/8 | 9½ | 3.50 | 3% | 16 | 15.60 |
| 111/6 | 93/4 | 3.70 | 35/8 | 16 | 15.90 |
| 13/4 | 10 | 3.90 | 311/6 | 16 | 16.20 |
| 113/6 | 101/4 | 4.10 | 33/4 | 16 | 16.50 |
| 17/8 | 10½ | 4.35 | 313/6 | 17 | 16.80 |
| 113/6 | 10¾ | 4.60 | 37/8 | 17 | 17.20 |
| 2 | 11 | 4.80 | 315/6 | 17 | 17.60 |
| 21/6 | 11½ | 5.15 | 4 | 17 | 18.00 |
| 21/8 | 11½ | 5.60 | . . | | |

These Mandrels are made of good tool steel, hardened and ground perfectly true, to fit holes reamed by our reamers. They are slightly tapering, and the size is stamped on the large end. They are not injured by careful driving. We recommend rawhide hammers for that purpose.

MORSE TAPER MANDRELS, EXPANDING SLEEVES

No. 123A



Fig. 6264A

| | Fig. 6264A | | | | | | | | | | |
|---|------------------------------|--|-----------------------------|------------------------------|---|--|------------------------------|---|-----------------------------|----------------------------------|--|
| Diameter Sleeve Inches | Price Each | Length Sleeve Inches | Taper Mandrels Number | Price Each | Length Over All Inches | Diameter Sleeve Inches | Price Each | Length Sleeve Inches | Taper Mandrels Number | Price Each | Length Over All Inches |
| 172 152 | .95 ,95 1.05 | 11/2 11/2 15/8 | 4 6 | 1.85 1.85 2.00 | 5 5 514 | 135 11% 137 137 | 3.90 4.00 4.00 | $ \begin{array}{c c} 31 & 2 \\ 31 & 2 \\ 31 & 2 \end{array} $ | 22 22 22 | 6.50 6.50 6.50 | 101/2 101/2 101/2 |
| 57 5/8 77 11/8 | 1.05 1.15 1.15 1.25 | 15/8 13/4 13/4 17/8 17/8 | 6 8 8 10 | 2.00 2.15 2.15 2.30 | 514 512 512 534 | 137 17/8 132 15/6 131 | 4.10 4.10 4.40 4.40 | 31/2 31/2 33/4 33/4 | 22 22 24 24 | 6.50 6.50 7.75 7.75 | 101/2 101/2 111/2 111/2 |
| 31/2 8/4 35/2 37/2 | 1.25 1.35 1.35 | $\begin{vmatrix} 2 \\ 2 \end{vmatrix}$ | 10 12 12 | 2.30 2.50 2.50 | $\begin{array}{c c} 53/4 \\ 6 \\ 6 \end{array}$ | 2 | 4.50 4.50 4.60 | 33/4 33/4 33/4 | 24 24 24 | 7.75 7.75 7.75 | 11½ 11½ 11½ |
| | 1.45 1.45 1.55 1.55 | $egin{array}{c} 2\frac{1}{8} \\ 2\frac{1}{8} \\ 2\frac{1}{4} \\ 2\frac{1}{4} \\ 2\frac{1}{4} \\ \end{array}$ | 14 14 14 14 | 2.70 2.70 2.70 2.70 | 61/2 61/2 61/2 61/2 | 2 \\ 2 \\ 2 \\ \ 2 \\ \ \ 2 \\ \ \ \ 2 \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | 4.60 4.70 4.70 4.80 | 37.8 37.8 37.8 37.8 | 24 24 24 24 | 7.75 7.75 7.75 7.75 | 111/2 111/2 111/2 111/2 |
| 1 | 1.80 1.80 1.95 | 23 8 23 8 23 8 | 16 16 16 | 3.00 3.00 3.00 | $ \begin{array}{c c} 71/2 \\ 71/2 \\ 71/2 \end{array} $ | $ \begin{array}{c c} \hline 2 & 7 \\ \hline 2 & 32 \\ 2 & 4 \\ 2 & 9 \\ \hline 3 & 2 \end{array} $ | 4.80 5.10 5.10 | 3/8 4 4 | 24 26 26 | 7.75 9. 0 0 9.00 | 111/4 121/4 121/4 |
| $1\frac{1}{32}$ $1\frac{1}{6}$ $1\frac{3}{32}$ $1\frac{1}{8}$ | 1.95 2.10 2.10 2.40 | 21/2 21/2 21/2 21/2 25/8 25/8 | 16 16 16 18 | 3.00 3.00 3.00 4 15 | $ \begin{array}{c c} 71\frac{7}{2} \\ 71\frac{7}{2} \\ 71\frac{2}{2} \\ 81\frac{2}{2} \end{array} $ | 25 12 25 12 25 15 15 15 15 15 15 15 15 15 15 15 15 15 | 5.20 5.20 5.30 5.30 | 4 | 26 26 26 26 | 9.00 9.00 9.00 9.00 | 121/2 121/2 121/2 121/2 |
| 1 32 1 3/16 1 3/1 | $2.40 \\ 2.50 \\ 2.50$ | 25/8 25/8 | 18 18 18 | 4.15 4.15 4.15 | 81/2 81/2 81/3 | 27/16 21/2 21/2 | 5.40 5.40 5.50 | 41/4 41/4 41/4 | 26 26 26 | 9.00 9.00 9.00 | 121 <u>4</u> 121 <u>4</u> 121 <u>4</u> |
| $1\frac{1}{4}$ $1\frac{9}{32}$ $1\frac{5}{16}$ $1\frac{11}{11}$ | 2.60 2.60 2.70 2.70 | $\begin{array}{c} 23\cancel{4} \\ 23\cancel{4} \\ 23\cancel{4} \\ 23\cancel{4} \\ 23\cancel{4} \end{array}$ | 18 18 18 18 | 4.15 4.15 4.15 4.15 | 81/2 81/2 81/2 81/2 | $2\frac{14}{2}$ $2\frac{16}{2}$ $2\frac{18}{2}$ $2\frac{18}{2}$ | 5.50 5.90 5.90 6.00 | 41/4 41/2 41/2 41/2 | | 9.00 12.10 12.10 12.10 | 121/2 131/2 131/2 131/2 |
| 1 5 16 1 11 1 3 8 1 13 1 7 16 | 3.10 3.10 3.20 | 3 3 3 | 20 20 20 | 5.30 5.30 5.30 | $ \begin{array}{c c} 91/2 \\ 91/2 \\ 91/3 \end{array} $ | 211/16 211/16 225/4 | 6.00 6.10 6.10 | 41/2 41/2 41/2 | 28 28 28 | 12.10 12.10 12.10 | 13½ 13½ 13¼ |
| $1\frac{1}{4}\frac{3}{2}$ $1\frac{1}{2}$ $1\frac{1}{4}\frac{7}{2}$ $1\frac{1}{2}$ | 3.20 3.30 3.30 3.40 | $ \begin{array}{c c} 3 \\ 3 \\ 4 \\ 3 \\ 4 \end{array} $ | 20 20 20 20 | 5.30 5.30 5.30 5.30 | 91/2 91/2 91/2 91/2 | 233 | 6.20 6.20 6.30 6.30 | 434 434 434 434 | 28 28 28 28 | 12.10 12.10 12.10 12.10 | 1314 1314 1314 1314 |
| 1 <u>1 3 8</u> 1 5 8 1 3 1 | 3.40 3.70 3.70 | 31/4 33/8 38/8 | 20 22 22 | 5.30 6.50 6.50 | $ \begin{array}{c c} 9\frac{1}{2} \\ 10\frac{1}{2} \\ 10\frac{1}{2} \end{array} $ | 25/8 27/8 27/8 25/6 25/6 | 6.40 6.40 6.80 | 434 434 5 | 28 28 30 | 12.10 12.10 15.50 | 131/2 131/2 141/2 |
| 1 1 16 1 3 2 1 3 4 | 3.80 3.80 3.90 | 33 8 33 8 33 8 | 22 22 22 | 6.50 6.50 6.50 | $ \begin{array}{c c} 10\frac{1}{2} \\ 10\frac{1}{2} \\ 10\frac{1}{2} \end{array} $ | $ \begin{array}{c c} 231 \\ 3 \\ 3_{32} \end{array} $ | 6.80 6.90 6.90 | 5 5 5 | 30 30 30 | 15.50 15.50 15.50 | 141/2 141/2 141/2 |

The entire Mandrel is hardened and the taper ground. The taper is such that it will hold the Sleeve and the work rigid. The Sleeve is of crucible steel, not hardened, and has several longitudinal slots giving the Sleeve greater flexibility. One of the slots is cut through allowing the Sleeve to expand or contract.



PATENT EXPANDING LATHE MANDRELS

NICHOLSONS'

FULL SET

Will Take Every Fractional Part of an Inch From 1 to 7 Inches



Fig. 9079A

| No. Mandrel | Expansion Inches | Length of Arbor, Inches | Length of Jaw Bearing, Inches | Price Each |
|----------------|---------------------|----------------------------|----------------------------------|---------------|
| 00 | 3/4 to 7/8 | 814 | *2 | 7.00 |
| 0 | ½ " 1 | 814 | 2 | 7.00 |
| 1 | 1 " 11/4 | 10 | 21/2 | 9.00 |
| 2 | 11/4 " 19/6 | 113/4 | 3 - | 10.50 |
| 3 | 1% " 2" | 143/4 | 4 | 14.50 |
| · 4 | 2 " 21/2 | 171/4 | 5 | 20.00 |
| 5 | 21/2 " 31/4 | 1834 | 53/4 | 32.00 |
| 6 | 314 " 4 | 21 | 6 | 39.00 |
| 7 | 4 " 5 | 231/4 | 7 | 40.00 |
| 8 | 5 " 6 | 25 | 8 | 41.25 |
| 9 | 6 " 7 | 25 | 9 | 43.75 |

^{*}No. 00 and No. 0 are special. No. 1 and larger are standard sets. Nos. 00 and 0 have but one set of jaws; Nos. 1, 2, 3 and 4 have each two sets; and Nos. 5, 6, 7, 8 and 9 have each three sets—marked A, B and C respectively.

SIZES TAKEN BY EACH SET OF JAWS

| No. Mandrel | A Jaws, Expansion Inches | B Jaws, Expansion Inches | C Jaws, Expansion Inches |
|----------------|---|---|----------------------------------|
| 00 | 3/4 to 7/8 | | |
| 0 | 7/8 " 1" | | |
| 1 | 1 " 11/8 | 1½ to 1¼ | |
| 2 | 11/4 " 1 4 4 5 | 1 | |
| 3 | 19/6 " 135 | 135 " 2 | |
| 4 | 2 " 21/4 | 21/4 " 21/2 | |
| 5 | 21/2 " 23/4 | 23/4 " 3 | 3 to 314 |
| 6 | 31/4 " 31/3 | 31/2 " 33/1 | 33/4 "4 |
| 7 | 4 | 411 " 4116 | 4û % " 5 |
| 8 | 5 " 5 นุ๊ | 5 1 5 1 6 | 5¼~ 6 |
| 9 | 6 "644 | 6 <u>33</u> "6½" | $6^{0.8}_{16}$ " $7\frac{1}{32}$ |

The dependable mandrels that are accurate and remain accurate for years. The "Nicholson" possesses the correct mechanical principle as regards expansion. With the spring or split sleeve types of expanding mandrels it is impossible. A true and accurate mandrel.

MORSE MILLING CUTTERS

No. 126



Fig. 8128A



Fig. 8128B

Cutters of 34-inch face and larger have spiral teeth unless otherwise ordered.

| Diameter of Cutter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each | Diameter of Cutter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each |
|--|--|-------------------------------|---------------|---|----------------------------|-------------------------------|---------------|
| 214 | 316 | 7/8 | 1.30 | 23/4 | 716 | 1 | 1.85 |
| $\overline{2}_{\overset{1}{4}}$ | $1\frac{n}{2}$ | | 1.75 | 23/4 | 1/3 | 1 1 | 1.90 |
| 214 | 1 | 78 | 2.50 | $\frac{2^{3}4}{2^{3}4}$ | 1½ 9/6 | 1 1 | 2.00 |
| 214 | 134 | 78 | 3.30 | 23/4 | 5/8 11 16 3/4 | 1 1 | 2.10 |
| 21/3 | 3.2 16 1 4 5 6 | 1 | 1.30 | 23/4 | 11/6 | 1 1 | 2.30 |
| \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 1 1 | 1 1 | 1.40 | $ \begin{array}{c} 23\overline{4} \\ 23\overline{4} \\ 23\overline{4} \\ 23\overline{4} \end{array} $ | 3/4 | 1 1 | 2.50 |
| 21/2 | 516 | 1 1 | 1.50 | 23/4 | $7\tilde{s}$ | 1 | 2.85 |
| 213 | 3. | 1 | 1.60 | 23/4 | 1 | 1 | 3.10 |
| 21% | 716 | 1 | 1.70 | 23/4 | 11/8 | 1 | 3.25 |
| 21/3 | 1/2 | 1 | 1.80 | 23/4 | 1^{1}_{4} | 1 | 3.40 |
| $2\frac{1}{2}$ | 97 | 1 | 1.90 | 2^3 | 11/2 | 1 1 | 3.75 |
| $21\sqrt{3}$ | 5 s | 1 | 2.00 | 234 | $1\frac{3}{4}$ | 1 | 4.00 |
| 213 | 11, | 1 | 2.10 | 234 | $\frac{2^{14}}{2!}$ | 1 1 | 4.20 |
| 21,3 | 34 13 16 | 1 | 2.20 | 23/4 | $2\frac{1}{2}$ | 1 1 | 4.60 |
| $2\frac{1}{2}$ | 13 | 1 | 2.30 | $2\hat{s}_{4}^{*}$ | 3 | 1 | 5.00 |
| $2\frac{1}{2}$ | 7.8 | 1 | 2.40 | 234 | $3\frac{1}{2}$ | 1 1 | 5.50 |
| $2\sqrt{2}$ | 1 | 1 | 2.60 | $\frac{2^{3}}{4}$ $\frac{2^{3}}{4}$ | 4 5 | 114 | 6.00 |
| $2\frac{1}{2}$ | 118 | 1 | 2.75 | 234 | 5 | 11/4 | 7.40 |
| $2\frac{1}{2}$ | $ \begin{array}{c c} & 11_4 \\ & 11_2 \\ & 13_4 \end{array} $ | 1 | 2.90 | 234 3 3 3 3 3 3 | 6 | $ 1 \rangle_4 $ | 10.00 |
| $2\frac{1}{2}$ | 11/2 | 1 1 | 3.10 | 3 - | 3/16 1/4 | 1 | 1.35 |
| $2\frac{1}{2}$ | $13\frac{7}{4}$ | 1 | 3.40 | 3 | 97 | 1 | 1.60 |
| $2\frac{1}{2}$ | •, | 1 | 3.70 | 3 | 516 | 1 | 1.85 |
| $2\frac{1}{2}$ | 214 | 1 | 3.90 | 3 | 3 8 | 1-114 | 2.10 |
| $2\frac{1}{2}$ | $1 2^{\frac{1}{2}}$ | 1 | 4.10 | 3 | 7/6 | 1-1 | 2.25 |
| $2\frac{1}{2}$ | $\begin{array}{c} 21_{4} \\ 21_{2} \\ 23_{4} \\ 3 \end{array}$ | 1 | 4.25 | 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | 3 8 7/16 1/2 9/16 | 1-114 | 2.40 |
| $2\frac{1}{2}$ | 3 | 1 1 | 4.50 | 3 | 9/6 | 114 | 2.55 |
| $2!\overline{2}$ | 31.2 | 1 | 5.00 | 3 | 5 8 | 11/4 | 2.70 |
| $2\frac{1}{2}$ | 4 | 1 | 5.50 | 3 | 11/6 | 11/4 | 2.85 |
| $\frac{21}{2}$ $\frac{21}{2}$ | 5 | 1 | 6.90 | 3 | 34 | 114 114 | 3.00 |
| $21\overline{2}$ | 6 | 1 | 8.50 | 3 | 78 | 114 | 3.30 |
| 2^3 | 316 | 1 1 | 1.30 | 3 | 1 | 11/4 | 3.60 |
| 2^3 | 1.4 5.16 | 1 | 1.50 | 3 | 114 | 114 | 4.00 |
| $23\frac{7}{4}$ | 516 | 1 | 1.60 | 3 | 11/2 | 11/4 11/4 11/4 | 4.30 |
| $23\frac{7}{4}$ | 3 3 | 1 | 1.80 | 3 | $\frac{137}{2}$ | 11/4 | 4.50 |
| | | | | 3 | 2 | 11/4 | 4.70 |

In ordering, carefully state diameter and face of cutter and size of hole desired.

No. 126







Fig. 288B

Cutters of 3/4-inch face and larger have spiral teeth, unless otherwise ordered.

| Diameter of Cutter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each | Diameter of Cutter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each |
|---------------------------------|----------------------------|-------------------------------|---------------|---------------------------------|----------------------------|---|---------------|
| 3 | $2\frac{1}{2}$ | 11/4 | 5.20 | 4 | 7/6 | 11/4 | 3.50 |
| 3 | 3 | 11/4 | 5.40 | 4 | 1/2 | 11/4-11/9 | 3.90 |
| 3 | $3\frac{1}{2}$ | 11/4 | 5.90 | 4 | 9/16 | 11/4 | 4.10 |
| 3 | 4 . | 11/4 | 6.40 | 4 | 5/8 | 11/4 | 4.30 |
| 3 | 5 | 11/4 | 7.80 | 4 | 11/10 | 11/4 | 4.50 |
| 3 | 6 | 11/4 | 10.80 | 4 | 3/4 | 11/4-11/2 | 4.70 |
| 31/2 | 3/16 | 1 | 1.45 | 4 | 7% | 11/4 | 5.15 |
| 31/2 | 1/4 | 1 | 1.70 | 4 | 1 0 | 11/4-11/2 | 5.65 |
| 31/2 | 516 | 1 | 2.05 | 4 | 11/4 | 11/4-11/2 | 6.25 |
| 31/2 | 3/8 | 1 | 2.40 | 4 | 11/2 | 11/4-11/2 | 6.65 |
| 31/2 | 7% | 1 | 2.75 | 4 | 13/4 | 11/4-11/2 | 7.05 |
| 31/2 | 716 1/2 | 11/4 | 3.15 | 4 | 24 | 11/4-11/2 | 7.45 |
| 31/2 | 9/16 | 11/4 | 3.30 | 4 | $\frac{1}{2}\frac{1}{2}$ | 11/4 | 8.40 |
| 31/6 | 5/0 | 11/4 | 3.45 | 4 | 3 | 11/4-11/2 | 9.00 |
| 31/2 | 5/8 11/16 | 11/ | 3.65 | 4 | 31/2 | 11/4 | 10.00 |
| 31/2 | 3/4 | 11/4 | 3.85 | 4 | 4 | 11/4-11/2 | 11.00 |
| 31/2 | 7% | 11/4 | 4.35 | 4 | 5 | 11/-11/6 | 13.50 |
| 316 | 1 8 | 11/4 | 4.75 | 4 | 6 | $ \begin{array}{c} 1\frac{4}{4} - 1\frac{7}{2} \\ 1\frac{3}{4} - 2 \\ 1\frac{3}{$ | 15.50 |
| 31/6 | 11/ | 11/4 | 5.15 | 41/2 | | 13/-2 | 3.35 |
| 31/2 | 11% | 111/ | 5.60 | 41/2 | 3/8 7/16 1/2 | 13/-2 | 3.75 |
| 31/2 | 13/4 | 111/ | 6.00 | 41/2 | 16 | 13/-2 | 4.10 |
| 31/2 | 2.4 | 11/ | 6.40 | 41/2 | 9/16 | 13/_2 | 4.40 |
| 312 | $\frac{21}{2}$ | 11/ | 6.90 | 41/2 | 56 | 13/-2 | 4.60 |
| 312 | 3 | 11/ | 7.40 | 41/2 | 11/8 | $1\frac{3}{4} - 2$ | 4.85 |
| 312 | 31/2 | 11/4 | 8.15 | 41/ | 3/ | $13\sqrt[4-2]{4-2}$ | 5.10 |
| 314 | 4 | 11/4 | 9.15 | 41/2 | 74 | 13/ 9 | 5.50 |
| 31/2 | 5 | 11/4 | 10.40 | 41/ | 1 8 | $1\frac{3}{4} - 2$ $1\frac{3}{4} - 2$ | 6.00 |
| 31/ | 6 | 11/4 | 11.90 | $\frac{41/2}{41/2}$ | 11/4 | $1\frac{3}{4}$ -2 | 6.60 |
| 4 | 1/ | 1 11/4 | 2.00 | | 11/2 | 11/4-2 | 7.25 |
| 4 | 5/4 | 1 11/4 | 2.50 | $\frac{41/2}{41/2}$ | | $1\frac{1}{4}$ -2 $1\frac{3}{4}$ -2 | 8.00 |
| 4 | 3/8 | 1-11/4 | 3.00 | 41/2 | $\frac{13}{4}$ | $1\frac{3}{4}$ -2 $1\frac{3}{4}$ -2 | 8.75 |

In ordering, carefully state diameter and face of cutter and size of hole desired.



No. 126B

No. 126G





Pig. 153A

Fig. 153B

No. 126B SIDE MILLING CUTTERS

| Diam. Inches | Width of Face Inches | Diam. of Hole Inches | Price Each | Diam. Inches | Width of Face Inches | Diam. of Hole Inches | Price Each |
|-------------------------------------|----------------------------|----------------------------|---------------|-----------------|----------------------------|----------------------------|---------------|
| 2 | 3 16 | 1/2-5/8 | 1.85 | 31/2 | 7.6 | 1 | 3.75 |
| 2 | 1/4 | 1/2-5/8 | 2.00 | 31/2 | 1/2 | 1 | 4.20 |
| 2 | 3/8 | 1/2-5/8 | 2.20 | 31/2 | 9 | 1 | 4.55 |
| 21/2 | 1/4 | 7/8 | 2.20 | 31/2 | 5/8 | 1 | 4.55 |
| $2\frac{1}{2}$ | 16 | 7/8 | 2.30 | 4 | 1/2 | 1 | 5.10 |
| $2\frac{1}{2}$ | 3/8 | 7/8 | 2.45 | 4 | 5/8 | 7/8-1-11/4 | 5.55 |
| $2\frac{1}{2}$ | 7 | 7/8 | 2.55 | 4 | 5/8 1/2 5/8 3/4 | 1 | 6.00 |
| 21/2 | 1/2 | 7/8 | 2.65 | 4 | 7/8 | 1 | 6.50 |
| 23/4 | 1/4 | 7/8 | 2.30 | 5 | 3/4 | 1-11/4 | 6.35 |
| $2\frac{3}{4}$ | 35 16 | 7/8 | 2.50 | 5 | 7/8 | 1 | 6.90 |
| 23/4 | 16 3/8 | 7/8 | 2.65 | 5 | 1 | 1 | 7.80 |
| 23/4 | 7 16 | 7/8 | 2.75 | 6 | 3/4 | 1 | 7.60 |
| $\frac{2^{3}}{4}$ $\frac{2^{3}}{4}$ | 1/2 | 7/8 | 2.80 | 6 | 15 | 11/4-11/2 | 8.65 |
| 3 | 1/4 | 1 | 2.45 | 6 | 1 | 1 | 8.65 |
| 3 | 5 | 1 | 2.75 | 7 | 1 | 11/4 | 16.10 |
| 3 | 3/8 7 | 1 | 3.00 | 7 | 11/8 | 11/4 | 17.25 |
| 3 | 7 | 1 | 3.20 | 8 | 1 0 | 11/4 | 19.55 |
| 3 | 1/2 | 1 | 3,35 | 8 | $1\frac{3}{8}$ | 11/4,11/13/4,2 | 23.00 |

Side milling cutters larger than 8-inch diameter furnished with inserted teeth.

Unless otherwise ordered, cutters of this style up to 2 inches in width, will be furished with straight teeth, wider than 2 inches with spiral teeth.

No. 126G INTERLOCKING CUTTERS

| Dia. of Face Diam. Cutter for Slot of Hole Inches Inches Inches | | | for Slot | Diam. of Hole Inches | Price per Pair | | | Diam. of Hole Inches | Price per Pair |
|--|------|-----------------|-----------------|----------------------------|----------------------|-----|----------------|----------------------------|----------------------|
| 3/8 1/2-5/8 | 3.70 | 23/4 | 3/4 | 7/8 | 5.30 | 4 | 11/4 | 78-1 | 11.10 |
| $2 \frac{1}{2} \frac{1}{2} - \frac{5}{8} $ | 4.00 | 234 | 1 | 7/8 | 5. 6 0 | 4 | 11/2 | 1 | 12.00 |
| $2 \begin{vmatrix} 3\frac{7}{4} & \frac{1}{2} - \frac{5}{8} \end{vmatrix}$ | 4.40 | 3 | 1.2 | 1 1 | 4.90 | 5 | $1\frac{1}{2}$ | 1 | 12.70 |
| $2\frac{1}{2}$ $\frac{1}{2}$ $\frac{7}{8}$ | 4.40 | ' 3 | 3,1 | 1 | 6.00 | 5 | 13/4 | 1 | 13.80 |
| $21\frac{7}{2}$ $3\frac{7}{4}$ $7\frac{7}{8}$ | 4.90 | 3 | 1 | 1 | 6.70 | 6 | 17. | 11/4-11/2 | 17.30 |
| $2! \circ 1 $ | 5.30 | 315 | 11% | 1 | 9.10 | . 7 | 21/4 | 11/4 | 34.50 |
| $2\frac{37}{4}$ $\frac{1}{2}$ $+$ $\frac{77}{5}$ | 4.60 | $31\frac{5}{2}$ | $11\frac{7}{4}$ | l | 9.10 | . 8 | 234 | 114-114 | 46.90 |

These cutters are made in two parts and can be readily adjusted for maintaining a standard width of slot. Unless otherwise ordered the two parts are furnished.

No.126 L. WITH RADIAL GROOVES

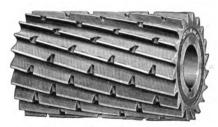


Fig. 607A

| Diameter of Cutter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each | Diameter of Cutter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each |
|---------------------------------|----------------------------|-------------------------------|---------------|---------------------------------|----------------------------|-------------------------------|---------------|
| 21/2 | 21/2 | 1 | 4.90 | 31/2 | 4 | 11/4 | 11.00 |
| $2\overline{1/2}$ | 23/4 | 1 | 5.15 | 31/2 | 5 | 11/4 | 12.50 |
| $2\frac{1}{2}$ | 3 | 1 | 5.40 | 31/2 | 6 | 11/4 | 14.25 |
| $2\frac{1}{2}$ | 31/2 | 1 | 6.00 | 4 | $2\frac{1}{2}$ | 11/4-11/2 | 10.00 |
| $21\overline{2}$ | 4 | 1 | 6.60 | 4 | 3 | 114-115 | 10.80 |
| 23/4 | 4 | 11/4 | 7.20 | 4 | 31/2 | 11/4-11/2 | 12.00 |
| 23/4 | 6 | 114 | 12.00 | 4 | 4 | 11/4-11/2 | 13.20 |
| 3 | $2\frac{1}{2}$ | 1,4 | 6.25 | 4 | 5 | 11/4-11/2 | 16.20 |
| 3 | 3 | 11/4 | 6.50 | 4 | 6 | 11/4-11/2 | 18.60 |
| 3 | 31/2 | 11/4 | 7.10 | 41/2 | $2\frac{1}{2}$ | 13/4-2 | 11.50 |
| 3 | 4 | 11/4 | 7.70 | 41/2 | 3 | 134-2 | 12.75 |
| 3 | 5 | 1,4 | 9.40 | 41/2 | 31/2 | 134-2 | 14.25 |
| 3 | 6 | $1^{1}4$ | 13.00 | 41/2 | 4 | 13/4-2 | 15.75 |
| $3\frac{1}{2}$ | $2\frac{1}{2}$ | 114 | 8.25 | 41/2 | 5 | 13/4-2 | 18.75 |
| 31∕2 | 3 | 11/4 | 8.90 | 41/2 | 6 | 134-2 | 22.25 |
| 3,12 | $3\frac{1}{2}$ | 11/4 | 9.80 | | l | l | 1 |

The above spiral milling cutters have radial grooves cut opposite each other in alternate teeth. Such cutters give greater space for oil and greater ease in milling, and are recommended for heavy milling.

RIGHT HAND CUTTER

NO. 126 A ANGULAR CUTTERS-RIGHT AND LEFT HAND



Fig. 607B

| Diameter of Hole Inches | Thickness Inches | Price Each | Diameter Inches |
|----------------------------|---------------------|---------------------|-------------------------------|
| 1/8 | 1/2 | 2.65 | 21/2 |
| 11/4 | 1/2 | $\frac{2.80}{3.35}$ | 2 ³ ⁄ ₄ |
| 11/2 | 1/2 | 3.75 | 314 |

45°, 50°, 60°, 70°, 80° angle in stock.

ANGULAR CUTTERS

Angular cutters are for cutting the teeth of cutters and mills and the side teeth of heading or straddle mills, but are not adapted for spiral milling. KEEP CUTTERS SHARP.

When ordering, state whether cutter is to be right or left hand

Nos. 126P AND 126%P SHELL END MILLS

LEET HAND MILL WITH STRAIGHT FLUTES

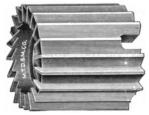


Fig. 327A

LEFT HAND MILL WITH SPIRAL FLUTES



Fig. 327B

| Diam. Inches | Length of Cut Inches | Diam. of Hole Inches | Price Each | Diam. Inches | Length of Cut Inches | Diam. of Hore Inches | Price Each |
|-----------------|----------------------------|----------------------------|---------------|-----------------|----------------------------|----------------------------|---------------|
| 11/4 | 11/4 | 1/2 | 2.80 | 23/16 | 13/4 | 3/4 | 4.50 |
| 15/6 | 11/4 | 1/2 | 2.90 | 21/4 | 21/4 | 1 | 4.90 |
| 13/8 | 11/4 | 1/2 | 3.00 | 25/6 | 21/4 | 1 | 4.95 |
| 17/6 | 11/4 | 1/2 | 3.10 | 23/8 | 21/4 | 1 | 5.00 |
| 11/2 | 11/4 | 1/2 | 3.20 | 27/6 | 21/4 | 1 | 5.05 |
| 19/16 | 134 | 3/4 | 3.90 | $2\frac{1}{2}$ | 21/4 | 1 | 5.10 |
| 15/8 | 13/4 | 3/4 | 3.95 | 29/6 | 21/4 | 1 | 5.20 |
| 111/16 | 13/4 | 3/4 | 4.00 | 25/8 | 21/4 | 1 | 5.35 |
| $1\frac{3}{4}$ | 13/4 | 3/4 | 4.05 | 211/16 | 21/4 | 1 | 5.50 |
| 113/16 | 13/4 | 3/4 | 4.10 | $2\frac{3}{4}$ | 21/4 | 1 | 5.65 |
| 17/8 | 13/4 | 3/4 | 4.15 | 213/6 | 21/4 | 1 | 5.80 |
| 115/16 | 13/4 | 3/4 | 4.20 | 27/8 | 21/4 | 1 | 5.95 |
| 2 | 13/4 | 3/4 | 4.30 | 215/16 | 21/4 | 1 | 6.10 |
| 21/6 | 13/4 | 3/4 | 4.35 | 3 | 21/4 | 1 | 6.30 |
| 21/8 | 13/4 | 3/4 | 4.40 | | | | |

These mills can be furnished with threaded holes. Prices furnished on application. When ordering give size of thread and state whether V or U. S. Standard is required. In ordering, state whether right or left hand mills are wanted.

RIGHT HAND CUTTER



ANGULAR CUTTERS AND CUTTERS FOR SPIRAL MILLS

No. 126K Formed Cutters

These cutters are same dimensions as cutters for spiral mills No. 126D. They are made to order and can be sharpened by grinding without changing their form.

Prices on application.



No. 126C, CONVEX AND CONCAVE MILLING CUTTERS FOR MILLING HALF CIRCLES

CONVEX



Fig. 154A

CONCAVE



Fig. 154B

| Diameter | Diameter | Diameter | Price | , Елен |
|---------------------|---------------------|--------------------|---------------|----------------|
| of Circle Inches | of Cutter Inches | of Holes Inches | Convex Cutter | Concave Cutter |
| 1/8 | 2 | 7/2 | 2.00 | 2.40 |
| 132 | 2 | 1 1/2 | 2.25 | 2.70 |
| 1% | 2 | / 1/8 | 2.50 | 3.00 |
| - 5 16 | 21/4 | 7% | 2.80 | 3.35 |
| 3/8 | 21/4 | 7% | 3.10 | 3.70 |
| τ ⁷ α | 21/4 | 7% | 3,35 | 4.00 |
| i% | 21/4 | 7% | 3.60 | 4.30 |
| 5/8 | $2\frac{3}{4}$ | 1′° | 4.00 | 4.80 |
| 3/4 | 3 | 1 | 4.40 | 5.25 |
| 78 | 31/4 | 1 | 4.80 | 5.75 |
| 1 " | 31/4 | 1 | 5.25 | 6.30 |
| 11/8 | 31/2 | 1 | 5,75 | 6.90 |
| 13/4 | 31/2 | 1 | 6.25 | 7.50 |
| $1\frac{3}{8}$ | 334 | 1 | 7.00 | 8.40 |
| $1\frac{1}{2}$ | 33/4 | 1 | 7.75 | 9.30 |

These cutters can be sharpened without changing their form.

RIGHT HAND CUTTER



Pig. 154C

No. 126D, CUTTERS FOR SPIRAL MILLS

| Diameter Inches | Price Each | Thickness Inches | Diameter Holo Inches |
|--------------------|---------------|---------------------|-------------------------|
| 21/2 | 2.65 | 1/2 | 7/4 |
| $2\frac{3}{4}$ | -2.80 | 1/2 | 1 |
| 3 | 3.35 | 1/2 | 11/4 |
| $3\frac{1}{4}$ | 3.75 | 1/2 | 11/2 |

These cutters have an angle of 40°, 48°, or 53°, with 12° the reverse side. They are carried in stock, both right and left hand, and when properly set will relieve themselves and cut smoothly.

No. 126N CORNER ROUNDING CUTTERS

SINGLE RIGHT HAND



Pig. 159A

DOUBLE RIGHT AND LEFT HAND



Fig. 159

SINGLE LEFT HAND



Fig. 159

These cutters have side and radial clearance, and can be sharpened by grinding without changing their form.

| Radius of Circle | Diameter of Cutter | Diameter of Hole | PRICE | , Елсн |
|-------------------------|-----------------------|---------------------|---------------|---------------|
| Inches | Inches | Inches | Single Cutter | Double Cutter |
| 1/6 | 2 | 7/4 | 2.00 | 2.40 |
| - 13° | $ar{2}$ | 1 1/8 | 2.25 | 2.70 |
| <u>;</u> | 2 | 7% | 2.50 | 3.00 |
| , 5 , | 214 | 1 % | 2.70 | 3.35 |
| 8 /4 | 217 | 7/8 2/8 | 2.90 | 3.70 |
| 1,2 | $\bar{2}i_{4}^{2}$ | 1% | 3.10 | 4.00 |
| i / ₄ | 217 | 1 7% | 3.30 | 4.30 |
| 5% | 23/4 | 1 1 " | 3,50 | 4.80 |
| 3% | 3 | 1 | 3.70 | 5.25 |
| 7% | 31/4 | 1 1 | 3.90 | 5.75 |
| 176 | 31/4 | 1 1 | 4.20 | 6.35 |
| 9% | 31/2 | 1 | 4.50 | 6.90 |
| 716 5/8 | 31/3 | ī | 5.00 | 7.50 |
| ₩ | 334 | l ī | 5.75 | 8.40 |
| 8% | 334 | ī | 6.50 | 9.30 |

In ordering single cutters, state whether right or left hand is wanted.

No. 126J SIDE MILLING CUTTERS With Inserted Teeth



Fig. 159D

| Diameter Cutter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each |
|------------------------------|----------------------------|-------------------------------|---------------|
| 6 | 2 | 11/4 | 21,50 |
| 7 | 2 | 11/4 | 25.00 |
| 8 | 2 | 11/2 | 27.50 |
| 9 | $oldsymbol{2}$ | 11/2 | 30.00 |
| 10 | $ar{f 2}$ | 11/2 | 32.50 |

Other sizes furnished to order at special prices.



MORSE MILLING CUTTERS AND SLITTING SAWS

No. 1267

No. 132





Fig. 160A

Fig. 160B

No. 126Y FACE MILLING CUTTERS WITH INSERTED TEETH

| Diameter Inches | Width of Face Inches | Number of Taper Hole | . Price Each | Diameter Inches | Width of Face Inches | Number of Taper Hole | Price Each |
|-----------------------------|----------------------------|----------------------------|-----------------|--------------------|----------------------------|----------------------------|---------------|
| 51/2 | 2 | 10 | 15.00 | 71/2 | 2 | 12 | 20.00 |
| $5\overline{1}\overline{2}$ | 2 | 12 | 15.00 | 81/2 | •23/8 | 12 | 22.50 |
| $6\frac{1}{2}$ | 2 | 10 | 17.50 | 91/2 | 23.8 | 12 | 25.00 |
| 61/2 | 2 | 12 | 17.50 | 1 | | 1 1 | |

The body of this cutter is of cast iron, has a taper hole and keyway and is held firmly on the arbor by a screw. The teeth are of tool steel, hardened and are adjustable. In ordering state whether right or left hand cutters are wanted. Other sizes made to order at special prices.

No. 132 METAL SLITTING SAWS

| Diameter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each | Diameter Inches | Width of Face Inches | Diameter of Hole Inches | Price Each |
|--------------------|--|-------------------------------|---------------|----------------------------|--|-------------------------------|---------------|
| 21/2 | 1 32 3 | 7/8 7/8 7/8 | 1.00 | 4 | 3 32 | 1 | 1.20 |
| 21/2 | 3 64 | 7/8 | . 95 | 4 | 32 1/8 5 3/2 3/16 1/6 3/3 3/2 | 1 | 1.20 |
| 21/2 | 1/16 | 7/8 | .90 | 4 | 32 | 1 | 1.40 |
| $2\frac{1}{2}$ | 716 3 32 1/8 5 32 1 32 32 32 33 32 | 7/8 | .90 | 4 | 3/16 | 1 | 1.60 |
| $2\frac{1}{2}$ | 1/8 | 7/8 | .90 | 5 5 5 5 5 5 | 16 | 1 | 1.80 |
| 21/2 | 32 | 7/8 | 1.10 | 5 | 3 32 | 1 | 1.50 |
| 21/2 | 32 | 1 | 1.00 | 5 | 1/8 | 1 | 1.50 |
| 21/2 | 3 64 | 1 | 1.00 | 5 | 1/8 | 11/4 | 1.50 |
| $2\frac{1}{2}$ | 17 | 1 | .90 | 5 | | 11/2 | 1.50 |
| 21/2 | 16 3 32 1/8 5 32 1 32 32 34 32 34 32 34 32 34 34 34 34 34 34 34 34 34 34 | 1 | .90 | 5 | 5 32 | 1 | 1.90 |
| 21/2 | 1/8 | 1 | .90 | 5 | 3/16 | 1 | 2.30 |
| $2\frac{1}{2}$ | 5 32 | 1 | 1.10 | 6 | 1/16 | 1 | 4.00 |
| 3 | 1 32 | 1 | 1.25 | 6 | 37 | 1 | 3.00 |
| 3 | 3 64 | 1 | 1.10 | 6 | 1/8 | 1 | 2,70 |
| 3 | 1/ | 1 | 1.00 | 6 | 3/16 | 1 | 3.50 |
| 3 | 716 3 32 | 1 . | 1.00 | 6 | 3/16 | 11/2 | 3.50 |
| 3 3 3 3 | 1/8 | 1 | 1.00 | 7 | 1/8 5/32 3/16 1/16 3/32 1/8 3/16 1/6 1/6 | 1 | 7.50 |
| 3 | 5 32 | 1 | 1.15 | 7 | 3 32 | 1 | 4.50 |
| 4 | 32 | 1 | 2.25 | 7 | 1/8 | 1 - | 3.80 |
| 4 | 3 64 | 1 | 1.45 | 8 | 3 32 1/8 1/8 | 1 . | 5.75 |
| 4 | 1/16 | 1 | 1.25 | | | | |

All these saws have holes ground to standard size, and the sides are ground with a proper clearance to allow the cutting of deep slots.

MORSE SCREW SLOTTING CUTTERS

No. 131



Fig. 7553A



Fig. 7553B

| Gauge Number | Price Each | Decimal Equivalent | Diameter Cutter Inches | Diameter Hole Inches | Gauge Number | Price Each | Decimal Equivalent | Diameter Cutter Inches | |
|-----------------|---------------|-----------------------|------------------------------|--|-----------------|---------------|-----------------------|------------------------------|--|
| 5 | .70 | .182 | 23/4 | 1 | 22 | .15 | .025 | 21/4 | |
| 6 | .60 | .162 | $2\frac{3}{4}$ | 1 | 23 | .15 | .023 | 212 | |
| 7 | .50 | .144 | 23/4 | 1 | 24 | .15 | .020 | 214 214 | |
| 8 | .45 | .128 | 23/4 | 3/4-1 | 25 | .15 | .018 | 21 | |
| 9 | .40 | .114 | 23/4 | 3/4-1 | 26 | .15 | .016 | 21 | |
| 10 | .35 | .102 | 23/4 | 3/4-1 | 27 | .15 | .014 | 21 | |
| 11 | .30 | .091 | 23/4 | 3/4-1 | 28 | .15 | .012 | 21 | |
| 12 | .25 | .081 | 23/4 | 3/4-1 | 30 | .15 | .010 | | |
| 13 | .20 | .072 | 23/4 | $\frac{3}{4}-1$ | 32 | .15 | .008 | | |
| 14 | .20 | .064 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 1/2, 5/8, 3/4, 1 | 34 | .15 | .006 | | |
| 15 | .15 | .057 | $2\frac{3}{4}$ | $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 | 14 | .15 | .064 | | |
| 16 | .15 | .051 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 | 15 | .15 | .057 | | |
| 17 | .15 | .045 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 | 16 | .15 | .051 | | |
| 18 | .15 | .040 | $2\frac{3}{4}$ | $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 | 17 | .15 | .045 | | |
| 19 | .15 | .035 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 | 18 | .15 | .040 | | |
| 20 | .15 | .032 | $2\frac{3}{4}$ | 12, 58, 34, 1 12, 58, 34, 1 | 19 | .15 | .035 | | |
| 21 | .15 | .028 | 23/4 | 1/2, 5/8, 3/4, 1 | 20 | .15 | .032 | | |
| 22 | .15 | .025 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 | 21 | .15 | .028 | | |
| 23 | .15 | .023 | 23/4 | 1/2, 5/8, 3/4, 1 | 22 | .15 | .025 | | |
| 24 | .15 | .020 | $2\frac{3}{4}$ | $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 | 23 | .15 | -04 | | |
| 25 | .15 | .018 | 23/4 | 1/2, 5/8, 3/4, 1 | 24 | .12 | .0: | | |
| 26 | .15 | .016 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 | 25 | .12 | | | |
| 27 | .15 | .014 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 | 26 | .12 | | | |
| 28 | .15 | .012 | 234 | 1/2, 5/8, 3/4, 1 | 27 | .12 | | | |
| 30 | .15 | .010 | 234 | 1/2, 5/8, 3/4, 1 | 28 | .12 | | | |
| 32 | .15 | .008 | $2\frac{3}{4}$ | 11111111111111111111111111111111111111 | 30 | .12 | | | |
| 34 | .15 | .006 | $2\frac{3}{4}$ | 1/2, 5/8, 3/4, 1 | 32 | .12 | | | |
| 20 | .15 | .032 | 214 | $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, 1 $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, | 34 | .12 | | | |
| 21 | .15 | .028 | 21/4 | 1/2, 5/8, 3/4. | | | | | |

No. 126T, FORMED CUTTERS, D



Fig. 7553C

These Cutters are of the same dimensioner made to order and can be sharpentheir form. Prices furnished on application



MORSE T SLOT CUTTERS

No. 126 V, MORSE TAPER SHANKS

LEFT HAND CUTTER



Fig. 328A

| Diameter Inches | Price Each | Thickness Inches | Diameter Neck Inches | Length Over All Inches | Length Neck Inches | Taper Shank Number |
|--------------------|--|---------------------|-------------------------|---------------------------------------|-----------------------|-----------------------|
| 1/2 5/8 | 1.65 1.95 | 5 32 52 | 7 32 9 | 3½ 3½ | 1/4 5/6 | 1 1 |
| 11 % 16 13 % | $egin{array}{c} 2.15 \ 2.50 \end{array}$ | 37 37 37 | 312 38 | 37% 31% 6 | 3.8 7.6 | $\frac{2}{2}$ |
| 18/6 | $2.75 \\ 3.25$ | 37 13 32 | 7/6 17/ 37/ | $\frac{4\frac{1}{32}}{5\frac{3}{32}}$ | 1/2 5/8 | 2 3 |
| 15/6 15/8 | $\frac{3.60}{3.90}$ | 117 116 | 312 312 312 | 5 <u>15</u> 6 <u>3 7</u> | 11/16 | 3 4 |
| 178 | 4.15 | 13/6 | 32 26 32 | $7\frac{32}{32}$ | 13/6 | 4 |

No. 126 W, BROWN & SHARPE TAPER SHANKS

LEFT HAND CUTTER



Fig. 328B

| Diameter Inches | Price Each | Thickness Inches | Diameter Neck Inches | Length Over All Inches | Length Neck Inches | Taper Shank Number |
|--------------------|---------------------|---------------------|-------------------------|--|-----------------------|-----------------------|
| 1/2 | 1.50 | 15, | 7, | 17/8 | 1/4 | 4 |
| 1/2 | 1.60 | 35. | 37 | 23% | 1/2 | 5 |
| 5/8 | 1.80 | 32 | 32 | 276 | 5/16 | 5 |
| 5/8 | 2.10 | 5 32 | 32 | 41/4 | 5/16 | 7 |
| 11/16 | 2.00 | $\frac{7}{32}$ | 31/2 | 25/8 | 3 8 | 5 |
| 11/6 | 2.20 | 3 ⁷ 2 | 312 | 476 | $\frac{3}{2}$ | 7 |
| 13/6 | 2.35 | 32 | 3/8 | 11/2 | 16 | 7 |
| 13/16 | 2.50 | 32 | 3/8 | 55/8 | 16 | 9 |
| 15/16 | 2.60 | 32 | 716 | 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 | 1/2 | 1 |
| 13/6 | $\frac{2.80}{3.10}$ | 32 13 | 16 | 61 | ½ 2 | 9 |
| 15/6 | 3.45 | 32 17 | 32 | 613 | 15/ | Q |
| 15% | 3.75 | 32 112 | 32 | 64 | 116 | ğ |
| 17% | 4.00 | 13/6 | 25 52 | $6\frac{32}{12}$ | 13/16 | 9 |

T slot cutters have diameters $\frac{1}{32}$ inch larger than sizes given above to allow for sharpening.

In ordering, state whether right or left hand is wanted.

MORSE END MILLS AND CUTTERS

No. 126F, MORSE TAPER SHANKS LEFT HAND MILL



Fig. 287A

No. 1261/2G, SPIRAL FLUTES, MORSE TAPER SHANKS

LEFT HAND MILL



Fig. 287B

| Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Morse Taper Shank No. | Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Morse Taper Shank No. | Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Morse Taper Shank No. |
|--|--|--|---|---------------------------------|--|--|--|---|----------------------------|---|--|--|---|----------------------------|
| 1/4/16/8/16/8/16/8/16/8/16/8/16/8/16/8/1 | 1.15 1.15 1.20 1.25 1.40 1.30 | 35 8 316 316 334 41/2 336 | 78 78 78 16 1 | 1 1 1 1 2 1 | 13, 16 13, 16 7, 8 7, 8 15, 16 15, 16 | 1.90 2.00 2.10 2.25 2.10 2.25 | 51/8 51/6 51/4 61/6 51/4 61/4 | $ \begin{array}{r} 1^{5}_{8} \\ 1^{5}_{8} \\ 1^{3}_{4} \\ 1^{3}_{4} \\ 1^{3}_{4} \\ 1^{3}_{4} \end{array} $ | 2 3 2 3 2 3 | 114 156 156 138 138 | 2.55 2.65 2.75 2.65 2.75 2.75 | 73/8 6/18 71/2 6/18 71/2 6/18 75/8 6/18 | 2 21/8 21/8 21/8 21/8 21/8 21/4 | 3 4 3 4 3 |
| 1/2 9/66 5/6/8 11/6 3/4 | 1.45 1.35 1.50 1.55 1.75 1.80 1.95 | 3136 45 8 37 8 434 5 51 8 51 8 | $\begin{array}{c} 1_{18} \\ 1_{16} \\ 1_{14} \\ 1_{12} \\ 1_{12} \\ 1_{15} \\ 1_{58} \\ 1_{58} \end{array}$ | 2 1 2 2 2 2 3 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 2.15 2.30 2.15 2.30 2.35 2.40 2.45 | 61.6 53.8 61.6 53.8 61.6 61.6 61.6 | 178 178 178 178 2 2 2 | 23233333 | 176 176 112 112 158 134 178 | 3.00 2.75 3.00 3.25 3.50 | 75/8 6/6 75/8 73/4 73/4 77/8 77/8 | 214 214 214 238 238 212 215 | 4 3 4 4 4 4 |

End mills with shanks other than listed made to order at special prices. Right and left hand mills carried in stock. In ordering state which is wanted.



Fig. 287C

No. 126M, SPROCKET WHEEL CUTTERS FOR BLOCK CENTER CHAINS

| No. of Teeth of Sprocket | Diam, of Cutter Inches | Hole in Cutter Inches | Price Each |
|-----------------------------|---------------------------|--------------------------|---------------|
| 6 | 23/4 | 1 | 6.00 |
| 7 | $2\frac{3}{4}$ | 1 | 6.00 |
| 8 | 23/4 | 1 | 6.00 |
| 9 | $2\frac{3}{4}$ | 1 | 6.00 |
| 10 and 11 | $2\frac{3}{4}$ | 1 | 6.00 |
| 12 " 13 | $23\frac{7}{4}$ | 1 | 6.00 |
| 14 to 16 | $2\frac{3}{4}$ | 1 | 6.00 |
| 17 " 20 | $2\frac{3}{4}$ | 1 | 6. 0 0 |
| 21 and over | $2\frac{3}{4}$ | 1 1 | 6.00 |

Sprocket wheel cutters furnished to order for the usual 1 inch pitch chain. The cutters are of the most approved form for the purpose required, and can be so made as to cut two teeth at once. In ordering, give the number of teeth of sprocket.

MORSE END MILLS AND CUTTERS

No. 1261/F, BROWN AND SHARPE SHANK LEFT HAND MILL



Fig. 282A

No. 126%H, SPIRAL FLUTES BROWN AND SHARPE SHANK LEFT HAND MILL

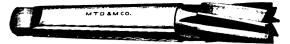


Fig. 282B

| Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Taper Shank Number | Diameter | Price Each | Length Over All Inches | Length of Flutes Inches | Taper Shank Number | Diameter | Price Each | Length Over All Inches | Length of Flutes Inches | Taper Shank Number |
|---|----------------------|---|----------------------------------|--------------------------|-------------------------|----------------------|------------------------------|--|--------------------------|--|--------------------|------------------------------|--|--------------------------|
| 1/4 1/4 5/4 | 1.00 | 27/16 3 | 13 16 13 16 7/ | 4 5 | 11/16 | 1.90 | 5½ 6¾ | $\frac{1\frac{1}{2}}{1\frac{1}{2}}$ | 7 9 | 1½ 1½ 1½ | 2.25 | 6 71/4 | 2 2 | 7 9 |
| 14 5 5 5 5 6 8 8 8 7 16 12 12 12 16 16 16 18 18 18 18 18 18 18 18 18 18 18 18 18 | 1.00 1.15 1.10 | $2\frac{1}{2}$ $3\frac{1}{16}$ $2\frac{1}{2}$ | 7/8 | 4 5 4 | 3/4 3/4 13/ 16 | 1.80 1.95 1.90 | 55/8 67/8 55/8 | $1\frac{5}{8}$ $1\frac{5}{8}$ $1\frac{5}{8}$ | 7 9 7 | $1\frac{3}{16}$ $1\frac{3}{16}$ $1\frac{1}{4}$ | 2.25 2.50 2.25 | 6 71/4 6 | 2 2 2 | 9 7 |
| 3/8 7/6 7/6 | 1.20 1.10 1.25 | 31 | 7/8 15/6 15/6 | 5 4 5 | 13/16 7/8 7/8 | 2.00 2.10 2.25 | $\frac{67/8}{53/4}$ | $1\frac{5}{8}$ $1\frac{3}{4}$ $1\frac{3}{4}$ | 9 7 9 | $1\frac{1}{4}$ $1\frac{5}{16}$ | 2.55 2.75 2.75 | 7½ 73/8 73/8 | $\begin{array}{c} 2 \\ 21/8 \\ 21/8 \end{array}$ | 9 9 |
| 1/2 | 1.30 1.45 1.35 | 216 31/8 33/6 51/8 | 11/8 | 5 | 15/16 15/16 | $\frac{2.10}{2.25}$ | 53/4 7 | $\frac{13/4}{13/4}$ | 7 9 | $\frac{17_{16}}{11_{2}}$ | 3.00 3.00 | 71/2 | $\frac{21/4}{21/4}$ | 9 |
| 916 5/8 | $1.50 \\ 1.45$ | 31/4 51/4 37/6 | 11/6 11/4 11/4 | 5 7 5 | 1 11/16 | 2.15 2.30 2.15 | 57/8 71/8 57/8 | 17/8 17/8 17/8 | 7 9 7 | $1\frac{5}{8}$ $1\frac{3}{4}$ | 3.25 3.50 | 75/8 73/4 | 23/8 21/2 | 9 |
| 5/8 | 1.70 | 51/2 | 11/2 | 7 | 11/16 | 2.35 | 71/8 | 17/8 | 9 | | | | | |

End mills with shanks other than listed made to order at special prices. Right and left hand mills carried in stock. In ordering state which is wanted.

No. 126R ANGULAR CUTTERS 81de Ground Concave

LEFT HAND CUTTER



Fig. 282C

| Ulameter Inches | Price Each | Thickness Inches | Diameter of Hole Inches |
|--------------------|---------------|---------------------|----------------------------|
| 21/2 | 2.65 | 1/3 | 7/8 |
| $23\frac{7}{4}$ | 2.80 | 1.5 | 1 |
| 3 ~ | 3.35 | 1/2 | 11/4 |
| $3\frac{1}{4}$ | 3.75 | 1/2 | 11/2 |

RIGHT AND LEFT HAND

These cutters are carried in stock, both right and left hand, with angles of 45°, 50°, 60°, 70° and 80°.

In ordering, state whether cutter is to be right or left hand.

MORSE END MILLS WITH CENTER CUT

No. 126%I, MORSE TAPER SHANKS

LEFT HAND MILL



Fig. 286A

| Diameter | Price Each | Length Over All Inches | Length of Flutes Inches | Morse Taper Shank Number | Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Morse Taper Shank Number | Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Morse Taper Shank Number |
|--|------------------------------|--|---|-----------------------------------|---|------------------------------|--|----------------------------------|-----------------------------------|---|------------------------------|--|----------------------------------|-----------------------------------|
| 1/2 1/2 9/16 9/16 5/8 11/16 3/4 3/4 13/16 13/16 | 1.50 1.80 1.70 1.85 | 3 ¹³ / ₁₆ 4 ⁵ / ₈ 3 ⁷ / ₈ 4 ³ / ₄ | 1 1½ 1½ 1½ 1¼ | 1 2 1 2 | 7/8 7/8 15/6 15/6 | 2.60 2.80 2.60 2.80 | $5\frac{1}{4}$ $6\frac{1}{16}$ $5\frac{1}{4}$ $6\frac{1}{16}$ $5\frac{3}{8}$ | 13/4 13/4 13/4 13/4 | 2 3 2 3 | $1\frac{1}{4}$ $1\frac{1}{4}$ $1\frac{5}{16}$ $1\frac{5}{16}$ | 3.20 3.30 3.45 3.55 | $\begin{array}{c} 3\frac{5}{16} \\ 7\frac{3}{8} \\ 6\frac{7}{16} \\ 7\frac{1}{2} \\ 6\frac{7}{16} \\ 7\frac{1}{2} \end{array}$ | 2 2 21/8 21/8 | 3 4 3 4 |
| 5/8 11/16 3/4 3/ | 2.10 2.15 2.25 2.45 | 5 5 5 ¹ / ₈ 5 ¹⁵ / ₁₆ | $ \begin{array}{c} 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{5}{8} \\ 1\frac{5}{8} \end{array} $ | 2 2 2 3 | $1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$ | 2.70 2.85 2.70 2.95 | 53/8 63/6 53/8 63/6 | 17/8 17/8 17/8 17/8 | 2 3 2 3 | $1\frac{3}{8}$ $1\frac{3}{8}$ $1\frac{7}{16}$ $1\frac{7}{16}$ | 3.45 3.55 | $\begin{array}{c} 6\frac{7}{16} \\ 7\frac{1}{2} \\ 6\frac{9}{16} \\ 7\frac{5}{8} \end{array}$ | 21/8 21/8 21/4 21/4 | 4 3 4 3 4 |
| 13/ 16 13/ 16 | $\frac{2.35}{2.50}$ | $5\frac{16}{5}$ $5\frac{15}{16}$ | $15\frac{15}{8}$ $15\frac{15}{8}$ | 2 3 | 11/8 13/6 | 3.00 3.10 | 6^{5}_{16} 6^{5}_{16} | 2 2 | 3 3 | $1\frac{1}{2}$ $1\frac{1}{2}$ | 3.75 4.00 | $\frac{3\frac{9}{16}}{75\frac{5}{8}}$ | 2½ 2½ 2½ | 4 3 4 |

In ordering state whether right or left hand is wanted.

No. 1261/2J, BROWN & SHARPE TAPER SHANKS LEFT HAND MILL

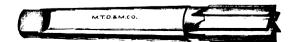
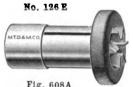


Fig. 286B

| Diameter Inches | Price Each | Length Over All Inches | Length of Flutes Inches | Taper Shank Number | Diameter | Price Each | Length Over All Inches | Length of Flutes Inches | Taper Shank Number | Diameter | Price Each | Length Over All Inches | Length of Flutes Inches | Taper Shank Number |
|--|---------------------|---|---|--------------------------|-----------------------|---------------------|------------------------------|----------------------------------|--------------------------|-------------------------------------|---------------------|------------------------------|---|--------------------------|
| 1/2 | 1.50 | 33/16 | 1 | 5 | 13/16 | 2.35 | 55/8 | 15/8 | 7 | 11/8 | 2.80 | 6 | 2 | 7 |
| 1/2 1/2 9/16 9/16 5/8 11/16 11/16 3/4 | 1.80 1.70 | 51/8 31/4 | $1\frac{1}{8}$ $1\frac{1}{16}$ $1\frac{1}{4}$ | 5 | 13/16 7/8 | $\frac{2.50}{2.60}$ | $\frac{67/8}{53/4}$ | $\frac{15/8}{13/4}$ | 9 7 | 11/8 13/6 | $\frac{3.00}{2.80}$ | 6 | 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 9 |
| 916 | 1.85 | 514 | 114 | 7 5 | 7/8 | 2.80 | 7 | 134 | 9 | $\frac{13}{16}$ $\frac{13}{16}$ | 3.10 | 71/4 | 2 | 9 |
| 5/8 | $\frac{1.80}{2.10}$ | $3\frac{7}{16}$ $5\frac{1}{2}$ $5\frac{1}{2}$ | 11/4 | 7 | 15 16 15 16 | $\frac{2.60}{2.80}$ | 53/4 | $\frac{13}{4}$ $\frac{13}{4}$ | 9 | $\frac{1\frac{1}{4}}{1\frac{1}{4}}$ | $\frac{2.80}{3.20}$ | 6 | 2 2 | 7 |
| 11/16 | 2.15 | $5\frac{1}{2}$ | $ \begin{array}{c} 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{5}{8} \end{array} $ | 7 | 1 | 2.70 | 57/8 | 17/8 | 7 | 15/16 | 3,45 | 71/4 73/8 | 21/8 | 9 |
| 116 | $\frac{2.35}{2.25}$ | 63/4 | 11/2 | 9 7 | 1 11 ₁₆ | $\frac{2.85}{2.70}$ | 71/8 57/8 | 17/8 17/8 | 9 | $\frac{13}{8}$ $\frac{17}{16}$ | 3.45 3.75 | 73/8 | 21/8 | 9 |
| 3/4 | 2.45 | 67/8 | 15/8 | 9 | 11/16 | 2.95 | 71/8 | 17/8 | 9 | 11/2 | 3.75 | 71/2 71/2 | 214 | 9 |

In ordering state whether right or left hand is wanted.

MORSE HOLLOW AND COTTER MILLS No. 1261/4 E





| | M.T.D.&M.CO | |
|---|--|--|
| | | |
| - | THE STATE OF THE S | |

| Fig. 608A | | | | | | | Fig. 608B | | | | | | |
|------------------------------|--|-----------------------------|--|---|---|---|--|--|--|---|--|--|---|
| No |). 126 E | . Ad | JUSTABLE | Hollow | MIL | ـــــــــــــــــــــــــــــــــــــ | No. 1261 E. Hollow Mill | | | | | | |
| Diameter Holo Inches | Price Each | Dlameter Shank Inches | Length Over All Inches Diameter | Inches Price Each | Diameter Shank Inches | Length Over All Inches Danmeter Hole | Price Fach | Outside Diameter Inches | Length Over All Inches | Diameter Hole Inches | Price Each | Outside Diameter Inches | Length Over All Inches |
| 371/8571/66721/4 971/86421/8 | 1.60 1.60 1.60 1.60 1.60 1.80 1.80 1.80 2.00 | 5 5/5 5 5/5 5 3/3/3/3/3/ | 11 2 70 11 2 12 11 2 13 11 2 9 11 2 5 11 2 3 11 2 3 2 7 2 15 2 15 2 15 | $\left[egin{array}{cccc} 2.20 \\ 2.40 \\ 2.60 \\ 2.80 \\ 3.00 \\ 3.20 \\ 3.40 \end{array} \right]$ | 34 1 1 1 114 114 114 112 112 112 | $\begin{array}{c} 2\\ 21\\ 4\\ 1\\ 1\\ 8\\ 21\\ 4\\ 3\\ 1\\ 2\\ 1\\ 4\\ 3\\ 1\\ 2\\ 2\\ 1\\ 2\\ $ | 1.00 1.00 1.00 1.00 1.00 1.50 1.50 1.50 | 5.5.8.8.8.8.8.8.4.4.4.4.4.4.4.4.4.4.4.4. | 11/2 11/3 11/2 11/2 11/2 11/2 11/2 11/2 | 3 8 7 16 1 1 2 9 16 1 5 8 11 16 1 3 4 1 7 8 1 1 | 2.00 2.00 2.00 2.00 2.50 2.50 2.50 2.50 | $ \begin{array}{c} 1 \\ 1 \\ 1 \\ 4 \\ 1 \\ 4 \\ 1 \\ 2 \\ 1 \\ 3 \\ 4 \end{array} $ | 134 134 134 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 14 |

The holes in the No. 126 E mills are carefully ground to size, and have a proper relief. Forcing the ring on the mill will correct any slight wear.

MORSE COTTER MILLS MORSE AND BROWN & SHARPE TAPER SHANKS No. 126 ½ L and No. 126 ½ M



| | Fig. 608C | | | | | | | | | | | | | |
|--|--|--|---|--|---|---|---|--|--|--|---|--|--|---|
| | No. 1 | 261 j. L. | Morse T. | No. 12612 M. B. & S. TAPER SHANK | | | | | | | | | | |
| Diameter Inches | Price Each | Length Over All Inches | Length of Body Inches Diameter Inches | Price Each | Length Over All Inches | Length of Body Inches | Diameter Inches | Price Each | Length Over All Inches | Length of Body Inches | Diameter Inches | Price Each | Length Over All Inches | Length of Body Inches |
| 1/4/5/16/3/8/16/3/7/16/3/8/16/5/8/5/8/16/5/8/5/5/5/8/16/5/8/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/5/ | 2.60 2.70 2.80 2.90 2.95 3.05 3.15 3.25 3.35 | 313 ₁₆ 414 474 414 5574 576 558 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 3.35 3.45 3.55 3.65 3.80 3.95 4.10 4.25 4.40 | 63 8 63 8 63 8 63 8 63 8 63 8 63 8 63 8 | 21 x 25 16 21 2 21 2 21 2 21 2 21 2 21 2 21 2 | 1 4 5 16 3 8 7 16 3 8 7 16 1 2 9 16 5 8 | 2.60 2.70 2.80 2.90 2.95 3.05 3.15 3.25 3.35 | 31 / ₈ 33 / ₈ 33 / ₄ 53 / ₈ 53 / ₆ 53 / ₆ | $\begin{array}{ c c c }\hline 11_4 \\ 11_2 \\ 10_6 \\ 17_8 \\ 10_{16} \\ 17_8 \\ 21_8 \\ 25_{16} \\ 21_2 \\ \end{array}$ | 1/2 9/16 5/8 11/6 3/4 13/16 7/8 15/16 1 | 3.35 3.45 3.55 3.65 3.80 3.95 4.10 4.25 4.40 | 75 16 75 16 75 16 75 16 75 16 75 16 | 21/8 25/16 21/2 21/2 21/2 21/2 21/2 21/2 21/2 |

| | | | | ··· — — — |
|-------------------------------|----------|----------|---|-----------|
| No. 1261 L MILLS HAVE MORSE | TAPER SH | ANKS A | IS FOLLO | ws |
| Diameter (inclusive) | inches | 1 to 716 | 3/8 to 5 8 1 1 | 2 to 1 |
| Morse Taper Shank | number | 1 | 2 | 3 |
| No. 1264 M MILLS HAVE B. & S. | TAPER SH | ANKS A | S FOLLOW | VS |
| Diameter (inclusive) | inches | 1, to 76 | $\begin{bmatrix} a_8 & \text{to } 5\frac{7}{8} \end{bmatrix}$ | 1 to 1 |
| Brown & Sharpe Taper Shank | | | 7 | 9 |

MORSE INVOLUTE CUTTERS

FOR TEETH OF GEAR WHEELS

These cutters can be sharpened by grinding the faces of the teeth. To preserve the form of the cutter care must be used in grinding to keep the face of each tooth radial.

To cut a set of interchangeable wheels with theoretical accuracy, as many cutters would be required as there are different wheels in the set, for the reason that, strictly speaking, the shape of the teeth should vary with every change in the number of teeth in the wheels. As this change of form is slight and becomes less with each increase in the number of teeth, it has been found that a set of wheels ranging from a pinion of twelve teeth to a rack can be cut with sufficient accuracy for most purposes by the use of eight cutters, as follows:—

| No. 1 will cut wheels from | 135 teeth to | a rack. |
|----------------------------|--------------|------------------|
| No. 2 will cut wheels from | 55 teeth to | 134 teeth. |
| No. 3 will cut wheels from | 35 teeth to | 54 teeth. |
| No. 4 will cut wheels from | 26 teeth to | 34 teeth. |
| No. 5 will cut wheels from | 21 teeth to | 25 teeth. |
| No. 6 will cut wheels from | 17 teeth to | 20 teeth. |
| No. 7 will cut wheels from | 14 teeth to | 16 teeth. |
| No. 8 will cut wheels from | 12 teeth to | 13 teeth. |

When greater accuracy in the shape of the teeth is desired, we are prepared to furnish to order, either cutters specially adapted to any given number of teeth, or for use with the regular set above, cutters in half numbers as follows:—

| Number of Cutter | Range | Range Number of Cutter | |
|--------------------|------------------|------------------------|-----------------|
| 11/2 | 80 to 134 teeth. | 51/2 | 19 to 20 teeth. |
| $2\dot{1}\sqrt{2}$ | 42 " 54 " | 61/3 | 15 " 16 " |
| $3\frac{1}{2}$ | 30 " 34 " | 71/2 | 13 |
| 41/2 | 23 " 25 " | | |

Each cutter is marked with its number, also the diametral pitch and number of teeth for which it is adapted. In ordering, give number of cutter and diametral pitch required.

No. 131 A STOCKING CUTTERS FOR INVOLUTE GEARS



Fig. 519A

| Diametral Pitch | Price Each | Diameter of Cutter, Inches | Diameter of Hole Inches |
|--------------------|---------------|----------------------------------|-------------------------------|
| *114 | 19.20 | 71/4 | 11/6 |
| *11.2 | 14.40 | 613 | 114 |
| *13% | 11.10 | 53% | īú |
| 2 | 7.50 | 5 | 14 |
| *21 (| 6.75 | 41/6 | 11/2 |
| 21/3 | 6.00 | 417 | 117 |
| *234 | 5.40 | 4 | 11/2 |
| 3 | 4.20 | 37/8 | 11/2 |
| *31.7 | 3.90 | 334 | 11/2 |
| *31/2 | 3.75 | 35% | 11/2 |
| *33.7 | 3.60 | 31% | 11/4 |
| 4 | 3.30 | 33/8 | 11/2 |
| *41/2 | 3.00 | 314 | 11/2 |
| 5 | 2.70 | 31/8 | 197 |
| *51/2 | 2.50 | 27% | 11/4 |
| . 6 | 2.35 | 23/4 | 11/2 |
| 7 | 2.20 | 25% | 11/2 |
| 8 | 2.05 | 21% | 112 |

^{*}Cutters are made to order.

MORSE INVOLUTE CUTTERS

FOR TEETH OF GEAR WHEELS





Pig. 539A

All gears of same pitch, cut with these cutters will interchange.

| Diametral Pitch | Price Each | Diameter of Cutter Inches | Diameter of Hole Inches | Diametral Pitch | Price Each | Diameter of Cutter Inches | Diameter of Hole Inches |
|--------------------|---------------|---------------------------------|-------------------------------|--------------------|---------------|---------------------------------|-------------------------------|
| *1 | 45.00 | 81/2 | 2 | 14 | 2.70 | 2 | 7/6 |
| *11/4 | 38.00 | 73/4 | . 2 | *15 | 2.60 | 2 | 7/8 |
| *11/2 | 32.00 | 7 | 13/4 | 16 | 2.50 | $\frac{1}{2}$ | 7/8 |
| *13/4 | 24.00 | 61/2 | 13/4 | 18 | 2.40 | 17/8 | 7/8 |
| 2 | 16.00 | 534 | 11/2 | 20 | 2.30 | 17/8 | 7/6 |
| *21/4 | 13.00 | 53/4 | 11/2 | 22 | 2.20 | 17% | 7% |
| 21/2 | 11.00 | $51\frac{1}{2}$ | $\frac{11/2}{11/2}$ | 24 | 2.10 | 134 | 7% |
| *23/4 | 10.00 | 51/8 | 11/2 | 26 | 2.00 | 134 | 7% |
| 3 | 8.00 | 43/8 | 11/4 | 28 | 1.80 | 134 | 7% |
| *31/4 | 7.00 | 41/4 | 11/4 | 30 | 1.80 | 134 | 7/8 |
| *31/2 | 6.75 | 41/8 | 11/4 | 32 | 1.80 | 134 | 7/6 |
| *33/4 | 6.50 | 4 | 11/4 | 34 | 1.80 | 134 | 7/8 |
| 4 | 6.00 | 37/8 | 11/4 | 36 | 1.80 | 13/4 | 7% |
| *41/2 | 5.50 | 33/4 | 11/4 | *38 | 1.80 | 13/4 | 7% |
| 5 | 5.00 | 35/8 | 14 | 40 | 1.80 | 134 | 7% |
| *51/2 | 5.00 | 35/8 | 11/4 | *44 | 1.80 | 134 | 7% |
| 6 | 4.30 | 3 ° | 1 | 48 | 1.80 | 13/4 | 7% |
| 7 | 4.10 | 27/8 | 1 | *50 | 1.80 | 13/4 | 7/0 |
| 8 | 3.90 | 27/8 | 1 | *56 | 1.80 | 13/4 | 7% |
| 9 | 3.70 | 23/4 | 1 | *60 | 1.80 | 13/4 | 7% |
| 10 | 3.50 | 21/4 | 7/6 | *64 | 1.80 | 13/4 | 7% |
| 11 | 3.30 | 21/4 | 7/8 7/8 7/8 7/8 | *70 | 1.80 | 13/4 | |
| 12 | 3.10 | 21/8 | 7% | *80 | 1.80 | 13/4 | 7% |
| *13 | 2.90 | 21/8 | 7% | *120 | 1.80 | 13/4 | 7% |

*Made to order only.

Eight cutters made for each pitch.

TE 2822 375

MORSE TWO_TE CUTTEE

OF THE SERVICE



MORSE TAPS

No. 138 MACHINISTS' HAND TAPS

SHANKS FULL SIZE OF THREAD

TAPER



PLUG



Fig. 7402A

Fig. 7402B

BOTTOMING



Fig. 7402C

| | | NUMBER | OF THREE | ADS TO THE INCH | | **** | | Price |
|---|-----------------|----------|----------|-----------------|----------------|--------------------------|-------|------------|
| Diameter Inches | U. S. Whitworth | | V Form | Other Threads | Also Furnished | Whole Length | Price | per Set |
| | Standard | Standard | v rorm | U. S. Form | V Form | Inches | Each | set |
| 1/6 | 64 | 4. | | 60, 72 | | 13/4 | .35 | 1.05 |
| 5 | | | | 56, 60 | | 13/4 | .35 | 1.05 |
| 1/16 54 33 7 74 /8 9 4 4 5 7 14 4 / 16 3 4 7 3 5 5 6 7 3 15 7 3 15 | 50 | | | 48, 56, 60 | | 13/4 | .35 | 1.05 |
| 7 | | | | 48 | | 13/4 | .35 | 1.05 |
| 1/8 | 40 | | | 32, 36, 48 | | 13/4 | .35 | 1.05 |
| 9 | | | | 32, 36, 40 | | 13/4 | .35 | 1.05 |
| 5 | 36 | | | 32, 40 | | 13/4 | .35 | 1.05 |
| 11 | | | | 32, 36 | | 21/4 | .35 | 1.05 |
| 3/6 | 32 | *24 | 24 | 24, 27, 30, 36 | 32 | 23/8 | .35 | 1.05 |
| 13 | | | | 24, 32 | | 23% | .35 | 1.05 |
| 7 | 28 | | | 24, 32 | | 23/8 | .35 | 1.05 |
| 15 | | | | 24, 28, 32 | | 21/2 | .35 | 1.05 |
| 1/ | 20 | 20 | 20 | 24, 27, 28, 32 | 24 | 21/2 | .45 | 1.35 |
| 17 | | | | 20, 32 | | 21/2 | .45 | 1.35 |
| 54 | 18 | 18 | 18 | 20, 24, 27 | 20, 24 | $\frac{2^{23}}{2^{33}}$ | .50 | 1.50 |
| 3/6 | 16 | 16 | 16 | 20, 24, 27 | 18, 20, 24 | $2^{\frac{32}{15}}_{16}$ | .55 | 1.65 |
| | 14 | 14 | 14 | 20, 27 | 16, 20, 24 | 3^{16}_{32} | .60 | 1.80 |
| 7/16 1/2 | 13 | 12 | 12 | 12, 20, 27 | 13, 20, 24 | 33/8 | .70 | 2.10 |

*We also furnish \%-inch Hand Taps with 32 threads to the inch. Whitworth Standard form, at regular list and discount.

Left hand taps are special.

U.S. form of thread always furnished unless otherwise ordered.

In ordering, parties will state whether they wish taps with shanks the full size of thread, or shanks size of bottom of thread. Unless otherwise specified, taps to and including 3s -inch will be furnished with shanks full size of thread. Larger than 3s -inch with shanks size of bottom of thread. Hand taps with shanks full size of thread furnished at regular list and discount.

All sizes, lengths and threads not listed will be considered special and subject to special prices.



MORSE TAPS NO. 138 MACHINISTS' HAND TAPS ER SHANKS SIZE OF BOTTOM OF THREAD

TAPER SHANKS SIZE OF BOTTOM OF THREAD PLUG

Fig. 7403C

| | | Nu | MBER OF | THREADS TO INCH | | | | |
|---------------------|----------|----------------|----------------|-----------------|---------------|------------------|-------|---------|
| Diam. | U. S. | Whitworth | V | Other Threads | lso Furnished | Whole Length | Price | Price |
| inches | Standard | Standard | Form | U. S. Form | V Form · | Inches | Each | per Set |
| 9/16 5/8 | 12 | 12 | 12 | 18, 27 | 14 | $3\frac{19}{32}$ | .80 | 2.40 |
| 5/8 | 11 | 11 | 11 | 12, 18, 27 | 10, 12 | 313/16 | .90 | 2.70 |
| 11/16 | 11 . | 11 | 11 | 12, 16 | 12 | $4\frac{1}{32}$ | 1.05 | 3.15 |
| 3/4 | 10 | 10 | 10 | 12, 16, 27 | 12 | 41/4 | 1.20 | 3.60 |
| 13/16 | 10 | 10 | 10 | 12 | 12 | 415 | 1.40 | 4.20 |
| 7/6 | 9 | 9 | 9 | 12, 14, 27 | 12 | 411/16 | 1.60 | 4.80 |
| 7/8 15/16 | 9 | 9 | 9 | 12 | 12 | 4 29 32 | 1.80 | 5.40 |
| 1 | 8 | 8 | 8 | 12, 14, 27 | 12 | 51/8 | 2.00 | 6.00 |
| 11/16 | 8 | | 8 | ,, | 12 | 51/8 | 2.15 | 6.45 |
| 11/8 | 7 | 7 | 7 | 12 | 12 | 57/6 | 2.25 | 6.75 |
| 13/16 | 7 | | 7 | | | 57/16 | 2.45 | 7.35 |
| 11/4 | *7 | 7 | *7 | | | 534 | 2.60 | 7.80 |
| 15/16 | 7 | | 7 | | | 534 | 2.80 | 8.40 |
| 1 3/ | 6 | 6 | 6 | | | 61/6 | 3.00 | 9.00 |
| $\frac{13/8}{17/6}$ | 6 | | 6 | | | 61/6 | 3.25 | 9.75 |
| 11/16 | 6 | 6 | 6 | | | 63/8 | 3.50 | 10.50 |
| 11/2 | | 5 | 5 | | | 098 | | 12.60 |
| 15/8 | 51/2 | 5 | 5 | | | 611/16 | | |
| 13/4 | 5 | 9 | | | | | 5.00 | 15.00 |
| 17/8 | 5 | 41/2 | 41/2 | | | 75/16 | 5.80 | 17.40 |
| 2 | 41/2 | 412 | 41/2 | | | 75/8 | 6.70 | 20.10 |
| $2\frac{1}{8}$ | 41/2 | 41/2 | $4\frac{1}{2}$ | | | 8 | 8.00 | 24.00 |
| 214 | 41/2 | 4 | 41/2 | | | 81/4 | 9.20 | 27.60 |
| 23/8 | 4 | 4 | $4\frac{1}{2}$ | | | 81/2 | 10.50 | 31.50 |
| $2\frac{1}{2}$ | 4 | 4 | 4 | | | 83/4 | 11.50 | 34.50 |
| 25/8 | 4 | 4 | 4 | | | 9 | 13.00 | 39.00 |
| 23/4 | 4 | 31/2 | 4 | | | 91/4 | 14.00 | 42.00 |
| 27/8 | 31/2 | 31/2 | 4 | | | 91/2 | 15.50 | 46.50 |
| 3 | 31/2 | $3\frac{1}{2}$ | 31/2 | | | 934 | 17.00 | 51.00 |
| 31/8 | 31/2 | 31/2 | 31/2 | | | 93/4 | 18.75 | 56.25 |
| 31/4 | 31/2 | 31/4 | 31/2 | | | 10 | 20.50 | 61.50 |
| 33/8 | 31/4 | 31/4 | 314 | | | 10 | 22.00 | 66.00 |
| 31/2 | 314 | 314 | 314 | | | 101/4 | 24.00 | 72.00 |
| 35/8 | 314 | 314 | 314 | | | 1014 | 26.00 | 78.00 |
| 334 | 3 | 3 | 3 | | | 101/2 | 28.50 | 85.50 |
| 37/8 | 3 | 3 | 3 | | | 101/2 | 30.00 | 90.00 |
| 4 | 3 | 3 | 3 | | | 1034 | 32.50 | 97.50 |

*We also furnish $\frac{3}{16}$ Hand Taps with 32 threads to the inch Whitworth Standard form at regular list, and discount.

Left Hand Taps are special.

U. S. Form of thread, always furnished unless otherwise ordered.

In ordering, parties will state whether they wish taps with shanks the full size of thread, or shanks size of bottom of thread. Unless otherwise specified taps to and including $\frac{3}{3}$ inch will be furnished with shanks full size of thread. Larger than $\frac{3}{3}$ inch with shank size of bottom of thread. Hand Taps with shanks full size of thread furnished at regular list and discount. All sizes, lengths, and threads not listed will be considered special and subject to special prices.

TAPS MACHINE OR NUT TAPS

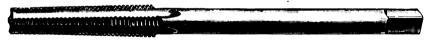


Fig. 7624A

| Diameter | Total Length | N | | READS TO INCH | | Price |
|--|------------------|---------------------------|-----------------------|---|-----------------------------|-------|
| Inches | Inches | U. S. Standard Threads | Standard V Threads | V Threads a so furnished | Whitworth Stan'd Threads | Each |
| 3/16 1/4 5/2 | 41/2 | 32 | 24 | 32 | 24 | .60 |
| 17 | 5 | 20 | 20 | 24 | 20 | .60 |
| 62 | 51/2 | 18 | 18 | 16, 20, 24 | 18 | .70 |
| 3% | 6 | 16 | 16 | 14, 18 | 16 | .80 |
| 78 | 61/2 | 14 | 14 | 12, 16 | 14 | .90 |
| 116 | 7 7 | 13 | 12 | 12, 10 | 12 | 1.00 |
| 73 | 71/2 | 12 | 12 | | 12 | 1.15 |
| 716 | 8 8 | 11 | 11 | 14 | 11 | |
| 3/8 | | ii | 11 | 10, 12 | | 1.30 |
| 216 | 81/2 | | | 12 | 11 | 1.45 |
| 24 | 9 | 10 | 10 | 12 | 10 | 1.60 |
| 2/16 | 91/2 | 10 | 10 | 12 | 10 | 1.80 |
| 18/8/16/2/16/8/16/4/16/8/16/8/16/8/16/8/16/4/16/8/16/8 | 10 | 9 | 9 | 10, 12 | 9 | 2.10 |
| 15/6 | 101/2 | 9 | 9 | 12 | 9 | 2.40 |
| 1 | 11 | 8 | 8 | 12 | 8 | 3.15 |
| 11/4 | 11 | 8 | 8 8 7 | | | 3.40 |
| 11% | 111/2 | 7 | 7 | 8 | 7 | 3.60 |
| 18% | 111/2 | 7 | 7 | | • | 3.90 |
| 1 1/6 1 1/8 1 3/6 1 1/4 1 5/6 | 12 | 7 | 7 | | 7 | 4.25 |
| 15% | 12 | 7 | Ť | | , | 4.50 |
| 13/ | 12½ 12½ 13 | 6 | 6 | ••••• | 6 | 4.80 |
| 13/8 17/6 | 191/ | 6 | 6 | ••••• | 0 | 5.00 |
| 11/6 | 1272 | 6 | e e | • | 6 | 5.65 |
| 179 | 131/2 | 51/2 | 6 5 | ••••• | P | 6.50 |
| 13/8 | 13/2 | 5 2 | 5 5 | | 5 5 | |
| 11/8 15/8 13/4 17/8 | | | | ••••• | 0 | 7.20 |
| 1 1/8 | 141/2 | 5 | 41/2 | • • • • • • • • | 41/2 | 8.25 |
| 2 | 15 | 41/2 | 41/2 | | 41/2 | 9.25 |
| 21/8 | 151/2 | 41/2 | 41/2 | | 41/2 | 10.80 |
| $2\frac{1}{4}$ | 16 | 41/2 | $4\frac{1}{2}$ | | 4 | 12.25 |
| $2\frac{3}{8}$ | 16½ | 4 | $4\frac{1}{2}$ | | 4 | 13.80 |
| $2\frac{1}{2}$ | 17 | 4 | 4 | | 4 | 15.00 |
| 25/8 | 171/2 | 4 | 4 | | 4 | 16.80 |
| 234 | 18 | 4 | 4 | l | 31/6 | 18.00 |
| 27/8 | 181/2 | 31/6 | 4 | | 31% | 19.80 |
| 3 | 19 2 | 31/3 | 31/3 | | 31% | 21.60 |
| 31/8 | 191/2 | 31/3 | 31/3 | | 31% | 24.70 |
| 31/ | 191/2 | 31/2 | 31% | | 312 | 26.88 |
| 33% | 20 2 | 31/ | 31/ | | 312 | 28.75 |
| 314 | 20 | 31/ | 31/ | | 31/ | 31.25 |
| 95/2 | 201/4 | 31/4 | 31/ | | 31/ | 33.75 |
| 23/ | 201/2 | 3 3 | 3 4 | ••••• | 3/4 | 36.88 |
| 977 | | | ე 9 | ••••• | 3 3 | |
| 3/8 | 21 | 3 3 | 3 3 | ••••• | 3 | 38.75 |
| 4 | 21 | 3 | ฮ | ! 1 | 3 | 41.88 |

All orders will be filled with U. S. Standard threads, unless otherwise specified. All sizes, lengths and threads not listed will be considered special and subject to special prices. Left hand taps are special.

TAPS TAPPER TAPS



Fig. 7625A

| Diame- | Length of | NUMBER (| OF THREA | DS TO INCH | WHO | LE LENGT | H. PRICE | EACH |
|---|--------------------------------------|-----------------------|------------------------------|--|----------------------|----------------------|----------------------|----------------------|
| ter, Inches | Thread, Inches | Standard V Threads | U. S. Standard Threads | Whitworth Standard Threads | 11 Inch | 12 Inch | 14 Inch | 15 Inch |
| 1/4 5/16 | 134 2 | 20 18 | 20 18 | 20 18 | .70 .80 | .75 .85 | .80 .90 | .90 1.00 |
| 3 8 7 16 | $\frac{2}{2!4}$ | 16 14 | 16 14 | 16 14 | .90 1.00 | .95 1.05 | 1.00 1.15 | 1.10 1.25 |
| 2 9 /8 5% | 21/4 21/2 21/2 21/2 21/2 | $12 \\ 12 \\ 11$ | 13 12 11 | $egin{array}{c} 12 \\ 12 \\ 11 \\ \end{array}$ | 1.12 1.30 1.45 | 1.15 1.35 1.50 | 1.25 1.45 1.65 | 1.35 1.55 1.75 |
| 1100 | 234 | 11 10 | 11 10 | 11 10 | 1.62 1.80 | 1.70 1.85 | 1.80 2.00 | 1.95 2.10 |
| 14\6\8\8\8\8\5\2\8\8\8\8\7\1\9\\$\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8\8 | $\frac{2\sqrt[3]{4}}{3}$ | 10 9 9 | 10 9 9 | 10 9 9 | 2.05 2.35 2.70 | 2.10 2.45 2.75 | 2.25 2.60 3.00 | 2,35 2,75 3,15 |
| $1\frac{1}{1\frac{1}{8}}$ | $\frac{3\frac{1}{2}}{3\frac{1}{2}}$ | 8 7 | 9 8 7 | 8 7 | 3.15 3.60 | 3.20 3.70 | 3.50 3.95 | 3.65 4.10 |
| $ \begin{array}{c c} 1\frac{1}{4} \\ 1\frac{3}{8} \\ 1\frac{1}{2} \end{array} $ | $\frac{3^1}{2}$ $\frac{4}{4}$ | 7 6 6 | 7 6 6 | 7 6 6 | 4.15 4.70 5.30 | 4.25 4.80 5.40 | 4.50 5.05 5.65 | 4.65 5.20 5.80 |

PULLEY TAPS



Fig. 7625B

| Dia me- | Number of U. S. Standard WHOLE LENGTH, PRICE EACH | | | | | | | | | | |
|--|---|--------|--------|---------|---------|---------|---------|---------|---------|---------|---------|
| Inches | Threads to Inch | 6 Inch | 8 Inch | 10 Inch | 12 Inch | 14 Inch | 16 Inch | 18 Inch | 20 Inch | 22 Inch | 24 Inch |
| 1/4 | 20 | .65 | .70 | .80 | .90 | | | | | | |
| 1/4 5/16 3/8 | 18 | .75 | .80 | 1.00 | 1.20 | | | | | | |
| 3/8 | 16 | .80 | .90 | 1.10 | 1.30 | 1.40 | 1.55 | 1.70 | | | |
| 7/16 | 14 | .90 | 1.00 | 1.20 | 1.40 | 1.50 | 1.65 | 1.80 | | | |
| 7/16 1/2 9/16 5/8 11/16 3/4 13/16 7/8 | 13 | 1.00 | 1.15 | 1.30 | 1.45 | 1.60 | 1.75 | 1.90 | 2.05 | | |
| 9/6 | 12 | 1.10 | 1.30 | 1.45 | 1.55 | 1.70 | 1.85 | 2.05 | 2.20 | 2.35 | |
| 5/8 | 11 | 1.20 | 1,35 | 1.50 | 1.60 | 1.75 | 1.90 | 2.10 | 2,25 | 2.40 | 2,55 |
| 11/16 | 11 | 1.30 | 1.45 | 1.55 | 1.70 | 1.90 | 2.05 | 2.20 | 2.35 | 2.50 | 2.65 |
| 3/4 | 10 | 1.40 | 1.50 | 1.60 | 1.80 | 2.00 | 2.15 | 2.30 | 2.45 | 2.60 | 2,75 |
| 13/16 | 10 | 1.60 | 1.70 | 1.80 | 2.00 | 2.15 | 2.30 | 2.45 | 2.60 | 2.75 | 2.90 |
| 7/8 | 9 | 1.80 | 1.90 | 2.10 | 2.30 | 2,50 | 2.70 | 2.90 | 3.10 | 3,30 | 3,50 |
| 15/16 | 9 | 2.00 | 2.10 | 2.30 | 2.50 | 2.70 | 2.90 | 3.10 | 3,30 | 3,50 | 3,70 |
| 1 | 8 | 2.25 | 2.30 | 2.50 | 2.70 | 2.90 | 3,10 | 3,30 | 3.50 | 3.70 | 3,90 |

Unless otherwise specified, U. S. Standard threads will be furnished.

TAPS

MACHINE SCREW TAP

STOVE BOLT TAP



Fig. 7558A

Pig. 7558B

MACHINE SCREW TAPS

| Size of Screw | Approxi- | Standard No. of | Threads also Furnished | | PRICE |
|--|--|--------------------|------------------------|------|-----------|
| Gauge Number | in Inches | Threads | | Each | Per Dozen |
| 1 | 116 | | 56, 60, 64, 72 | .35 | 4.00 |
| 11/2 | | | 56 | .35 | 4.00 |
| 2^{-} | 3 B | 56 | 45,64 | .35 | 4.00 |
| $egin{array}{c} 1rac{1}{3} \ 2 \ 3 \end{array}$ | 37 8 64 8 64 L | 48 | | .35 | 4.00 |
| 4 | 64 L | 36 | 32, 40, 42, 48 | .35 | 4.00 |
| 4 5 6 | 1 L | 36 | | .35 | 4.00 |
| | 10 L S S S S S S S S S S S S S S S S S S | 32 | 32, 40 | .35 | 4.00 |
| 7 | 32 | 32 | 30, 40 | .35 | 4.00 |
| 8 | H s | 32 | 30, 36, 40 | .35 | 4.00 |
| 9 | 18 S | 30 | 28, 32 | .35 | 4.00 |
| 10 | 13 L | 24 | | .35 | 4.00 |
| 11 | li s | 24 | 28,30 | .35 | 4.00 |
| 12 | 37 L | 24 | 1 | .35 | 4.00 |
| 13 | 11 L | 22 | | .38 | 4.40 |
| 14 | 1 s | 20 | 18, 24 | .38 | 4.40 |
| 15 | } L | 20 | 18, 24 | .38 | 4.40 |
| 16 | 32 S | 18 | 16, 20 | .38 | 4.40 |
| 18 | 1 8 S | 18 | 16, 20 | .38 | 4.40 |
| 20 | A L | 16 | 18 | .45 | 5.30 |
| 22 | 21 s | 16 | 18 | .45 | 5.30 |
| 24 | 25.8 | 16 | 14, 18 | .45 | 5.30 |
| 26 | 3½ L | 16 | 14 | .53 | 6.30 |
| 28 | 16 | 14 | 16 | .53 | 6.30 |
| 30 | 33 | 14 | 16 | .53 | 6.30 |

Left Hand Machine Screw Taps are Special.

STOVE BOLT TAPS

| Diameter, Inches | No. of Threads to Inch | Price | | |
|--|----------------------------------|--|--|--|
| plameter, menes | No. of Threads to Inch | Each | Per Dozen | |
| 52 1.6 3.7 4 1.6 3.7 4 1.6 3.7 3.7 3.8 | 28 24 22 18 18 16 | .35 .35 .35 .38 .38 .45 | 4.00 4.00 4.00 4.40 4.40 5.30 | |

All Sizes and Threads not listed will be considered special and subject to special prices.

Less than six Taps of a Size and Thread will be charged as single Taps.

Machine Screw Taps furnished in sets of taper, plug and bottoming when desired at regular prices.

Diameters, Inclusive, inches

Price per inch

STAY BOLT TAPS



15 to 1 11/6 to 11/8 13/6 to 11/4 15/6 to 13/4 17/6 to 11/4 31 to 1/8 .55

.60

.50

In ordering, state diameter, pitch and form of thread, also lengths of parts A, B, C, D and E. These taps will be furnished in either U. S. form or V form of thread, 12 to the inch, at regular list and discount. Diameter given is that of the thread at its straight

.45

.40

Prices are for each inch of length, 16 inches and upwards. Taps shorter than 16 inches will be charged as if 16 inches long.

Stay Bolt Taps 20 inches and 24 inches long, in sizes from 34 to 11/2 inches diameter and having proportions shown in following table, are regularly made and carried in stock at factory.

| Total Length Inches | | DIME | nsions in Inche | ES AT | |
|------------------------|---|------|-----------------|-------|------|
| Inches | A | В | C | D D | E |
| 20 | 1 | 6 | $1\frac{1}{2}$ | 6 | 51/3 |
| 24 | 1 | 8 | 2 | 6 | 7 |

SPINDLE STAY BOLT TAPS



Fig. 5666B

| Diameter | LENGTH OF T | HREAD, INCHES | Total Length | Diameter of Spindle | Length of Spindle | Price |
|----------|------------------------|---------------|--------------|------------------------|----------------------|-------|
| Inches | Inches Fluted Unfluted | Inches | Inches | Inches | Each | |
| 3/4 | 31/4 | 23/4 | 75/8 | 3/8 | 11 | 8.00 |
| 13/16 | 31/4 | 23/4 | 75/8 | 3/8 | 11 | 8.50 |
| 7/8 | 31/4 | 23/4 | 75/8 | 3/8 | 11 | 9.00 |
| 15/16 | 31/4 | 23/4 | 75/8 | 3/8 | 11 | 9.50 |
| 1 | 31/4 | 234 | 75% | 3/8 | 11 | 10.00 |
| 11/6 | 31/4 | 234 | 75/8 | 3/8 | 11 | 10.50 |
| 11/8 | 31/4 | 23/4 | 75% | 3/8 | 11 | 11.00 |
| 136 | 31/4 | 234 | 75% | 3/8 | 11 | 11.50 |
| 11/4 | 31/4 | 23/4 | 75% | 3/8 | 11 | 12.00 |
| 15/6 | 31/4 | 234 | 75/8 | 3/8 | 11 | 12.25 |
| 13/8 | 31/4 | 234 | 75/8 | 3/8 | 11 | 12.50 |
| 17/6 | 314 | 234 | 75/8 | 3/8 | 11 | 12.75 |
| 11/2 | 31/4 | 234 | 75/8 | 3/8 | 11 | 13.00 |

All orders for Stay Bolt Taps will be filled with Taps cutting 12 threads to the inch unless otherwise specified.

TAPS

BOILER TAP. STRAIGHT AND TAPER



PATCH BOLT TAP



Fig. 9887A

Fig. 9887B

BOILER TAPS, STRAIGHT AND TAPER, 12 THREADS TO INCH

| Diameterinches | 1/2 | 16 | 5/8 | 118 | 3/4 | 13 | 7/8 |
|----------------|------|------|------|------|------|------|------|
| Price each | 1.00 | 1.15 | 1.30 | 1.45 | 1.60 | 1.80 | 2.10 |
| Diameterinches | 15 | 1 | 116 | 11/8 | 178 | 11/4 | 15% |
| Priceeach | 2.40 | 2.80 | 3.00 | 3.20 | 3.40 | 3.70 | 4.00 |
| Diameterinches | 13/8 | 17/6 | 11/2 | 15/8 | 1¾ | 17/8 | 2 |
| Price each | 4.30 | 4.60 | 4.90 | 5.10 | 5.40 | 5.70 | 6.00 |
| Diameterinche. | 21/8 | 21/4 | 23/8 | 21/2 | | | ···· |
| Price each | 6.50 | 7.00 | 7.50 | 8.00 | | | |

PATCH BOLT TAPS, 12 THREADS TO INCH

| Diameterinches | 1/2 | 81 | 5/8 | 18 | 3/4 | 13 | 1/8 |
|----------------|------|------|------|------|------|------|------|
| Priceeach | .70 | .80 | .90 | 1.05 | 1.20 | 1.40 | 1.60 |
| Diameterinches | 18 | 1 | 116 | 11/8 | 13/6 | 11/4 | |
| Priceeach | 1.80 | 2.00 | 2.15 | 2.25 | 2.45 | 2.60 | |

PIPE TAPS AND REAMERS





Fig. 9887C Fig. 9887D 14 3/8 3/4 11/4 Diameter.....inches 1/8 1/2 Price, Taps or Reamerseach 3.12 1.12 1.25 1.50 1.87 2.50 3.75 21/2 11/2 2 3 31/2 Diameter.....inches Price, Taps or Reamerseach 4.62 6.2510.50 15.00 42.00 | 50.00

HUMPHREY'S COMBINED DRILL, REAMER AND TAP



Fig. 9887E

| Diameterinches | 1/4 | 3/8 | 1/2 | 3/4 | 1 | 11/4 | 11/2 | 2 |
|----------------|------|------|------|------|------|------|------|-------|
| Priceeach | 2.50 | 2.50 | 3.00 | 4.50 | 6.00 | 7.25 | 8.50 | 10.50 |

TAPS BLACKSMITH TAPER TAPS



Fig. 5661A

| Diameter Inches | Number of Threads to Inch | Price Each | Diameter Inches | Number of Threads to Inch | Price Each |
|--------------------|------------------------------|---------------|--------------------|------------------------------|---------------|
| 14 | 18, 20, 24 | .30 | 3/4 | 10, 12 | .65 |
| 16 | 16, 18, 20 | .30 | 7/8 | 9, 10 | .90 |
| 3 8 | 14, 16, 18 | .35 | 1 | 8 | 1.25 |
| 176 | 14, 16, 18 | . 40 | 11/8 | 7,8 | 1.50 |
| 1,2 | 12, 13, 14, 16 | .40 | 11/4 | 7, 8 | 1.75 |
| 16 | 12, 14 | .50 | 11/2 | 6 | 3.00 |
| 5 8 | 10, 11, 12 | .50 | | | |

All sizes and threads not listed are special and subject to special prices.

BIT BRACE TAPS



Fig. 5661B

| Dlameter | No. of T | | Total Length | Price | Diameter | No. of Threads to Inch | | Total Length | Price |
|----------|-------------------|-----------|-----------------|-------|----------|---------------------------|-----------|----------------------|-------|
| Inches | U. S. Standard | V Form | Inches | Each | Inches | U. S. Standard | V Form | Inches | Each |
| 3/6 | 30 | 24 | 314 | .50 | 3/8 | 16 | 16 | 35/8 33/4 37/8 | .60 |
| 14 | 20 | 20 | 33 8 | .50 | 176 | 14 | 14 | 33/4 | .70 |
| 16 | 18 | 18 | 31/2 | . 55 | 1/2 | 13 | 12 | 37/8 | .80 |

Unless otherwise specified, all orders will be filled with U.S.S. threads.

V-form threads at same list prices.

All sizes, lengths and threads not listed, and left hand threads, are special.

BRAZED BRASS TUBING TAPS

RIGHT OR LEFT HAND



Fig. 5661C

| Diameter | Number of | Price | Diameter | Number of | Price |
|----------------------------|----------------------------|--------------------------|---------------------|----------------------------|-----------------------------|
| Inches | Threads to Inch | Each | Inches | Threads to Inch | Each |
| 1 4 5 16 3 8 7 16 | 27 27 27 27 27 | .45 .50 .55 .60 | 58 34 78 1 | 27 27 27 27 27 | .90 1.20 1.60 2.00 |

These taps are also furnished with English Standard, 26 threads to the inch, when so ordered.

These taps cut straight thread. Left hand taps are special.

DRILL RODS

For Twist Drills, Taps, Reamers, Punches, and all small tools requiring the very highest grade of crucible cast tool steel.

| ze | Equivalent Decimals of an Inch | per | Size | Equivalent Decimals of an Inch | per | Size | Equivalent Decimals of an Inch | Price per Pound | Size | Equivalent Decimals of an Inch | Price per Pound |
|--|--------------------------------------|-----|--|--------------------------------------|-----|---|--------------------------------------|-----------------------|---|--------------------------------------|-----------------------|
| 1/4 | 1.250 | .50 | 7/ | 0.4375 | .60 | 11 | 0.188 | .75 | 45 | 0.081 | 1.05 |
| 4 | | | 7/16 | 0.4218 | .75 | | 0.1875 | | 46 | 0.079 | 1.05 |
| 514 | 1.2343 | .50 | 27 64 Z | | .75 | 3/16 12 | | .75 | | | |
| 1 | 1.2187 | .50 | | 0.413 | | | 0.185 | .75 | $\frac{5}{64}$ | 0.0781 | 1.20 |
| | 1.203 | .50 | $\overset{13}{\overset{32}{2}}$ | 0.4062 | .75 | 13 | 0.182 | .75 | | 0.077 | 1.20 |
| | 1.1875 | .50 | Y | 0.404 | .75 | 14 | 0.180 | .75 | 48 | 0.075 | 1.20 |
| | 1.1718 | .50 | X | 0.397 | .75 | 15 | 0.178 | .75 | 49 | 0.072 | 1.20 |
| | 1.1562 | .50 | $\overset{25}{64}$ | 0.3906 | .75 | 16 | 0.175 | .83 | 50 | 0.069 | 1.20 |
| | 1.1406 | .50 | W | 0.386 | .75 | 17 | 0.172 | .83 | 51 | 0.066 | 1.45 |
| | 1.125 | .50 | V | 0.377 | .75 | 11 64 | 0.1718 | .83 | 52 | 0.063 | 1.45 |
| 3 | 1.1093 | .50 | 3/8 | . 0.375 | .75 | 18 | 0.168 | .83 | 1/16 | 0.0625 | 1.45 |
| | 1.0937 | .50 | 3/8 U | 0.368 | .75 | 19 | 0.164 | .83 | 1/16 53 | 0.058 | 1.45 |
| | 1.0781 | .50 | 23 | 0.3593 | .75 | 20 | 0.161 | .83 | 54 | 0.055 | 1.45 |
| | 1.0625 | .50 | $\overset{\frac{23}{64}}{\mathrm{T}}$ | 0.358 | .75 | 21 | 0.157 | .83 | 55 | 0.050 | 1.80 |
|) | 1.0468 | .50 | S | 0.348 | .75 | | 0.1562 | .83 | | 0.0468 | 1.80 |
| | 1.0312 | .50 | 11 | 0.3437 | .75 | $\frac{\frac{5}{32}}{22}$ | 0.155 | .83 | $\begin{array}{c} \frac{3}{64} \\ 56 \end{array}$ | 0.045 | 1.80 |
| | | | $\frac{11}{32}$ | | .75 | | | | | | |
| | 1.0156 | .50 | IN. | 0.339 | | 23 | 0.153 | .83 | 57 | 0.042 | 1.80 |
| | 1.000 | .50 | Q | 0.332 | .75 | 24 | 0.151 | .83 | 58 | 0.041 | 2.10 |
| | 0.9843 | .50 | 64 P | 0.3281 | .75 | 25 | 0.148 | .83 | 59 | 0.040 | 2.10 |
| | 0.9687 | .50 | P | 0.323 | .75 | 26 | 0.146 | .83 | 60 | 0.039 | 2.10 |
| | 0.953 | .50 | 0 | 0.316 | .75 | 27 | 0.143 | .83 | 61 | 0.038 | 2.40 |
| | 0.9375 | .50 | 5/16 N | 0.3125 | .75 | 9 64 | 0.1406 | .83 | 62 | 0.037 | 2,40 |
| | 0.9218 | .50 | N | 0.302 | .75 | 28 | 0.139 | .83 | 63 | 0.036 | 2.70 |
| | 0.9062 | .50 | $\stackrel{\frac{19}{64}}{\mathrm{M}}$ | 0.2968 | .75 | 29 | 0.134 | .83 | 64 | 0.035 | 2.70 |
| | 0.8906 | .50 | M | 0.295 | .75 | 30 | 0.127 | .83 | 65 | 0.033 | 2.70 |
| | 0.875 | .50 | T. | 0.290 | .75 | 1/8 | 0.125 | .83 | 66 | 0.032 | 3.00 |
| | 0.8593 | .50 | 1 | 0.2812 | .75 | 31 | 0.120 | .90 | | 0.0312 | 3.00 |
| | 0.8437 | .50 | K | 0.281 | .75 | 32 | 0.115 | .90 | $\frac{1}{32}$ 67 | 0.031 | 3.00 |
| | 0.828 | .50 | J | 0.277 | .75 | 33 | 0.112 | .90 | 68 | 0.030 | 3.00 |
| | 0.8125 | .50 | I | 0.272 | .75 | 34 | 0.112 | .90 | 69 | 0.030 | 3.30 |
| | 0.7968 | .50 | H | 0.266 | .75 | | 0.1093 | .90 | 70 | 0.027 | 3.30 |
| | | .50 | | 0.2656 | | $\begin{array}{c} \frac{7}{64} \\ 35 \end{array}$ | | | | 0.026 | |
| | 0.7812 | | 17 64 G | | .75 | | 0.108 | .90 | 71 | | 3.60 |
| | 0.7656 | .50 | | 0.261 | .75 | 36 | 0.106 | .90 | 72 | 0.024 | 3.60 |
| , | 0.750 | .55 | F | 0.257 | .75 | 37 | 0.103 | .90 | 73 | 0.023 | 3.60 |
| | 0.7343 | .55 | E | 0.250 | .75 | 38 | 0.101 | .90 | 74 | 0.022 | 3.90 |
| | 0.7187 | .55 | 1/4 D | 0.250 | .75 | 39 | 0.099 | 1.05 | 75 | 0.020 | 4.05 |
| | 0.703 | .55 | | 0.246 | .75 | 40 | 0.097 | 1.05 | 76 | 0.018 | 4.20 |
| | 0.6875 | .55 | C | 0.242 | .75 | 41 | 0.095 | 1.05 | 77 | 0.016 | 4.50 |
| | 0.6718 | .55 | В | 0.238 | .75 | $\frac{\frac{3}{32}}{42}$ | 0.0937 | 1.05 | $\frac{1}{64}$ 78 | 0.0156 | 4.50 |
| | 0.6562 | .55 | $\frac{15}{64}$ | 0.2343 | .75 | 42 | 0.092 | 1.05 | 78 | 0.015 | 4.80 |
| | 0.6406 | .55 | A | 0.234 | .75 | 43 | 0.088 | 1.05 | 79 | 0.014 | 5.10 |
| , | 0.625 | .55 | 1 | 0.227 | .75 | 44 | 0.085 | 1.05 | 80 | 0.013 | 5.40 |
| | 0.6093 | .55 | 2 | 0.219 | .75 | | | | , | | - 1 - 0 |
| | 0.5937 | .55 | 7 | 0.2187 | .75 | 1 | SQUAR | RE DE | RILL | RODS | |
| | 0.578 | .55 | $\frac{7}{32}$ 3 | 0.212 | .75 | | | | | | |
| | 0.5625 | .55 | 4 | 0.207 | .75 | 1/2 | 0.500 | 1.60 | 1/4 | 0.250 | 1.60 |
| - | 0.5468 | .55 | 5 | 0.204 | .75 | 15 | 0.4687 | 1.60 | 1/4 7 32 3/16 | 0.219 | 1.60 |
| | 0.5312 | .55 | | 0.204 | .75 | 15 32 7/16 | 0.4375 | 1.60 | 32 | 0.1875 | 1,60 |
| | | | 13 64 C | | | 16 | 0.4062 | 1.60 | 16 | 0.156 | 1.60 |
| | 0.5156 | .55 | 6 | 0.201 | .75 | 13 32 3/8 | | | 1/8 | | |
| | 0.500 | .60 | 7 | 0.199 | .75 | 18 | 0.375 | 1.60 | 1/8 | 0.125 | 1.60 |
| THE PROPERTY OF THE PROPERTY O | 0.4843 | .60 | 8 | 0.197 | .75 | 32 | 0.344 | 1.60 | 32 | 0.094 | 1.60 |
| released and | 0.4687 | .60 | 9 | 0.194 | .75 | 16 | 0.3125 | 1.60 | 1/16 | 0.625 | 1.60 |
| 1 | 0.4531 | .60 | 10 | 0.191 | .75 | 32 | 0.281 | 1.60 | | | |

DRILL CHUCKS

LITTLE GIANT, IMPROVED

Nos. 00 to 24 INCLUSIVE









Fig. 1186B



Fig. 1186C

| Number | 00 | 0 | 1 | 2 | 21/2 | 3 | 4 |
|----------------|------|------|---------|--------|------------------|-----------|--------|
| | | | 3 | 31/2 | 4 | 6 | 61/2 |
| For Drills " | | | 0 to 34 | 0 to 1 | 0 to 1 Ex.Strong | 0 to 11/2 | 0 to 2 |
| Priceeach | 7.00 | 8.00 | 9.00 | 10.00 | 11.00 | 18.00 | 20.00 |
| " Ex. Screws " | 1.00 | 1.00 | 1.00 | 1.10 | 1.50 | 2.50 | 3.00 |

LITTLE GIANT, AUXILIARY SCREW

1/2 to 11/4 INCH INCLUSIVE

1% to 4 INCH INCLUSIVE



Fig. 1186D



Fig. 1186E

| Size, Number inches | 1/2 | 3/4 | 1 | 11/4_ | 11/2 | 2 | 25/8 | 3 | 35/8 | 4 |
|---------------------------|------|------|--------------|-------|-------|-------|----------------|------------|-------|-------------|
| Diameterinches For Drills | 214 | 3 | 3½ 0 to 1 | 47/8 | 6 | 61/2 | 7¼ 1,2-25/8 | 9 | 11 | 131/4 |
| Recess for Face Plate | | 1 | | | | | | l . | l | |
| Priceinches | 8.00 | 9.00 | 10.00 | 15.00 | 18.00 | 20.00 | 6½ 30.00 | 8 35.00 | 50.00 | 10 60.00 |

LITTLE GIANT, DOUBLE GRIP



Fig. 1186P

| Number | 0 | 1 | 2 | 21/2 | · 3 | 4 |
|---|----------------|-----------------------|-----------------------|---------------------------------|-----------------------|-----------------------|
| Diameter inches For Drills " Price each | 0 to ½ 8.00 | 3 0 to 3/4 9.00 | 3½ 0 to 1 10.00 | 4 0 to 1 Ex. Streng 11.00 | 6 0 to 1½ 18.00 | 6½ 0 to 2 20.00 |

No. 3 and 4 are made in straight body only.

DRILL CHUCKS

New Model

Skinner

Geared Pattern

Standard

ALMOND

Geared Nut

Fig. 5810A

Fig. 5810B

Fig. 5810C

Fig. 5810D

SKINNER NEW MODEL

| Number | 11 | 12 | 13 |
|------------------------------|--------|--------|---------|
| For Drillsinches | 0 to 3 | 0 to H | 0 to 37 |
| For Drills inches Price each | 5.50 | 5.50 | 9.00 |

SKINNER GEARED PATTERN

| Number | | 22 | | |
|------------------------------|----------|----------|---------|------------|
| For Drills inches Price each | 0 to 1/4 | 0 to 3/8 | 0 to 13 | 1/6 to 3/4 |
| Priceeach | 6.00 | 6.00 | 10.00 | 18.00 |

ALMOND STANDARD PATTERN

| Number | 1 | 2 | 3 |
|------------------------------|----------|----------|----------|
| For Drills inches Price each | 0 to 3/6 | 0 to 1/6 | 0 to 1/2 |
| Priceeach | 5.50 | 5.50 | 9.00 |

ALMOND GEARED NUT

| Number | | |
|-------------------|----------|----------|
| For Drills inches | 0 to 5/6 | 0 to 1/2 |
| Price each | 5.50 | 9.00 |

JACOBS IMPROVED



Fig. 5810E

UNION CZAR



Fig. 5810F

JACOBS IMPROVED

| Number | | | | | | | | 5 |
|------------------------------|---------|----------------|---------|----------|-------------------|----------------------|----------|---------|
| For Drills inches Price each | 0 to 13 | 0 to 1/4 | 0 to 31 | 0 to 3/8 | 0 to \frac{17}{2} | 0 to $\frac{17}{32}$ | 1/6to3/4 | 3% to 1 |
| Priceeach | 5.50 | 5.50° | 5.50 | 5.50 | 9.00 | 9.00 | 18.00 | 25.00 |

UNION CZAR

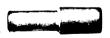
| Number | 1 | 2 | 3 |
|------------------|---|----------|----------|
| For Drillsinches | | 0 to 5/c | 0 to 1/6 |
| Priceeach | | | |

CENTER ARBORS FOR DRILL CHUCKS

PLAIN ARBOR

Pig. 5846A

BLACKSMITHS'



Pig. 5846B

PLAIN ARBORS-Shank 41/2 Inches Long

Price, 1-inch diametereach .50

BLACKSMITHS'

| Size Shank | 1/2, 3 and # |
|------------|--------------|
| Priceeach | .50 |
| | |

BIT BRACE



Fig. 5846C

ARBOR WITH NUT



Fig. 5846D

BIT BRACE ARBORS

Priceeach 50

ARBORS WITH NUT

TAPER ARBORS



Fig. 5846E

| For Morse Taper Shanksnumber | 1 | 2 | 3 | 4 | 5 |
|------------------------------|---|------|------|------|------|
| Priceeach | | 1.00 | 1.25 | 1.50 | 2.00 |

The above Arbors are made fitting the Almond, Beach, Czar, Jacobs, Goodell. Pratt, Reid, Standard, Skinner Pattern, Westcott and Little Giant Chucks.

GEARED SCROLL CHUCKS

SOLID IRON SHELL

OUTSIDE JAWS No. 133-3-Jaw



Fig. 5708A

TWO SETS OF JAWS No. 153-3-Jaw



Fig. 5708C

INSIDE JAWS No. 143-3-Jaw No. 144-4-Jaw



Fig. 5708B

No. 163-3-Jaw



Fig. 5708D

| Center Face | | Тике | e Jaw | Four | JAW | Price, | Price | |
|----------------|----------------|-----------------|--|--|--|--|------------------------------------|------------------------------------|
| Inches | Hole Inches | Plate Recess | Price, with One Set of Jaws Each | Price, with Two Sets of Jaws, Each | Price, with One Set of Jaws Each | Price, with Two Sets of Jaws, Each | with 3 Reversible Jaws, Each | with 4 Reversible Jaws, Each |
| $2\frac{1}{2}$ | .9 16 | 1136 | 7.50 | 9.00 | | | 7.50 | |
| 3 | 5/8 | 278 | 10.00 | 12.00 | 11.00 | 13.60 | 10.00 | 11.00 |
| 4 | 3/1 | 3 | 12.00 | 14.40 | 13.20 | 16.40 | 12.00 | 13.20 |
| 5 | 78 | 3_{16}^{11} | 15.00 | 18.00 | 16.50 | 20.50 | 15.00 | 16.50 |
| 6 | 1 9 | 434 | 18.00 | 21.60 | 19.80 | 24.60 | 18.00 | 19.80 |
| $7\frac{1}{2}$ | 2 | 437 | 20.00 | 24.00 | 22.00 | 27,30 | 20.00 | 22.00 |
| 9 | 21/2 | $5\overline{3}$ | 24.00 | 28.80 | 26.40 | 32,80 | 24.00 | 26.40 |
| 101/2 | 3 | 537 | 27.00 | 32.40 | 29.70 | 37.00 | 27.00 | 29.70 |
| 12 | 3 | 7 ~ | 30,00 | 36.00 | 33.00 | 41.00 | 30.00 | 33.00 |
| 15 | 317 | 8 | 40.00 | 48.00 | 44.00 | 54.60 | 40.00 | 44.00 |
| 18 | 31/2 | 10 | 55.00 | 66.00 | 62.00 | 77.00 | 55.00 | 62.00 |
| 21 | 412 | 11 | 80.00 | 96.00 | 90,00 | 110.00 | 80,00 | 90.00 |

UNION LATHE CHUCKS

WITH REVERSIBLE JAWS

No. 21 COMBINATION

No. 42 UNIVERSAL REVERSIBLE JAWS

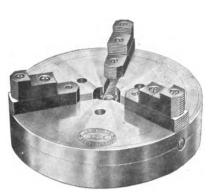


Fig. 2153A

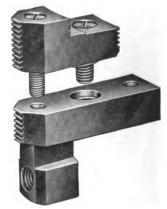


Fig. 2153B

The No. 21 combination is the chuck most generally specified for ordinary lathe work. The jaws are easily reversed, and strong and durable.

In the above illustration is shown the reversible jaw used in the Univeral and Combination chucks listed below. Note that in order to reverse the jaw it is not necessary to lift the top part from the bottom, insuring accuracy.

| Size | Center Hole | Face Plate | Will Hold | Weight | PRICE, EACH | | |
|------------|-------------|------------------|-----------|--------|-------------|--------|--|
| Inches Inc | Inches | Recess, Inches | Inches | Pounds | 3-Jaw | 4-Jaw | |
| 5 | 11/4 | 311/6 | 51/2 | 25 | 25.00 | 30,00 | |
| 6 | 11/4 | 311/6 | 67 | 25 | 26.00 | 32.00 | |
| 8 | 11/2 | $5\frac{1}{32}$ | 81/2 | 46 | 30.00 | 38.00 | |
| 9 | 11/2 | $5\frac{1}{32}$ | 91/2 | 55 | 34.00 | 42.00 | |
| 12 | 15/8 | 63/8 | 121/5 | 83 | 44.00 | 56.00 | |
| 15 | 2 | 71/16 | 155% | 85 | 52.00 | 64.00 | |
| 18 | 23/8 | 8 | 185/8 | 140 | 62.00 | 75.00 | |
| 21 | 23/4 | $9\frac{21}{32}$ | 221/2 | 173 | 80.00 | 95.00 | |
| 24 | 23/4 | 10 | 241/2 | 200 | 100.00 | 120.00 | |
| 26 | 31/4 | 12 | 27 | 252 | 130.00 | 160.00 | |
| 30 | 31/2 | $16\frac{1}{16}$ | 31½ | 300 | 170,00, | 200.00 | |
| 36 | 4 | 173/4 | 37 | 390 | 230.00 | 285.00 | |
| 42 | | | | | 270.00 | 325.00 | |

A combination chuck is one in which the jaws can be operated together, as in a Universal chuck, or by releasing the gearing singly, as in an Independent chuck. In other words, a combination chuck is a combination of both the Universal and Independent styles. One advantage of the combination chuck over the Universal lies in the fact that to remove the jaws from a chuck of this style it is only necessary to set the chuck as an Independent, and then run each jaw separately to the center. In a Universal chuck it is necessary to take the chuck apart to remove the jaws.

A Universal chuck is one in which all the jaws are operated by the application of the wrench at one pinion. This style of chuck has a common center at all times, and none of the jaws can be operated independently of the others.

UNION INDEPENDENT LATHE CHUCKS

No. 118

IRON BODY

No. 318 REVERSIBLE JAWS





This new Iron Body Independent Chuck has socket screws, which give a longer bearing of the screw in the jaw, and also hardened steel thrust bearings, which take the thrust of the screw. In the 12-inch sizes and larger the jaws have a double bearing rib, on which the jaw slides. This makes a stronger and better wearing chuck than ever before made with an iron body.

| Size Inches | Center Hole Inches | Face Plate Recess, Inches | Diameter Inches | Weight Pounds | Price Each | Extra Jaws per Set of 4 | Size Inches | Center Hole Inches | Face Plate Recess, Inches | Diameter Inches | Weight Pounds | Price Each | Extra Jaws per Set of 4 |
|----------------|--------------------------|------------------------------------|--------------------|------------------|---------------|-------------------------------|----------------|--------------------------|------------------------------------|--------------------|------------------|---------------|-------------------------------|
| 4 | 118 | 314 | 4 | 8 | 14.00 | 6.00 | 24 | 4.1 | 12 | 24 | 288 | 65.00 | |
| 5 | 11% | 3 | 5 | 10 | 16.00 | 7.00 | 26 | $5\frac{1}{2}$ | 12 | 26 | 319 | 80.00 | |
| 6 | 134 | 5 | 6 | 16 | 18.00 | 7.00 | 28 | 513 | 12 | 28 | 354 | 100.00 | 40.00 |
| 8 | 2 | 5 | 8 | 36 | 22.00 | 8.00 | 30 | 5°_{2} | 12 | 30 | 442 | 120.00 | |
| 9 | 2 | 5 | 9 | 40 | 24.00 | | 32 | $51\frac{1}{2}$ | 173/4 | 32 | 518 | 150.00 | |
| 10 | 2 | 5 | 10 | 47 | 26.00 | 8.00 | 34 | 513 | 173_{4} | 34 | 560 | 180.00 | 46.00 |
| 12 | 3 | 7 | 12 | 93 | 30.00 | 13.00 | 36 | $5^{1}\frac{7}{2}$ | 17:4 | 36 | 575 | 210.00 | 50.00 |
| 14 | 3 | 8 | 14 | 115 | 34.00 | 13.00 | 38 | 6 | 20 | 38 | 1089 | 240.00 | |
| 15 | 3 | 8 | 15 | 123 | 35.00 | 13.00 | 40 | 6 | 20 | 40 | 1175 | 270.00 | |
| 16 | 3 | 8 | 16 | 128 | 38.00 | 13.00 | 42 | 6 | 20 | 42 | 1203 | 300.00 | |
| 18 | 43/4 | 10 | 18 | 184 | 44.00 | 19.00 | 44 | 6 | 20 | 44 | 1250 | 350.00 | |
| 20 | 434 | 10 | 20 | 208 | 50.00 | 19.00 | 46 | 6 | 20 . | 46 | 1500 | 420.00 | |
| 22 | 434 | 10 | 22 | 255 | 57.00 | 21.00 | 48 | 6 | 20 | 48 | 1600 | 500.00 | · · · · · · |

When ordering chucks, be careful to give our catalogue number, showing the style wanted and also the number of jaws wanted in the chuck. Special chucks have to be made, sometimes entire, but we are fitted to supply such chucks as promptly as they can be made.

An independent chuck is one in which each jaw is moved to or from the center separately. In an independent chuck but one jaw can be moved at a time.

No. 318 IRON BODY

These chucks are now made in the same style as the No. 118, with socket screws, and in sizes 12-inch and upwards, with double ribs.

| Size Inches | Center Hole Inches | Face Plate Recess, Inches | Diameter Inches | *Weight Pounds | Price Each | Extra Jaws per Set of 3 | Size Inches | r'enter Hole Inches | Face Plate Recess, Inches | Diameter Inches | Weight Pounds | Price Each | Extra Jaws per Set of 3 |
|----------------|--------------------------|------------------------------------|--------------------|-------------------|---------------|-------------------------------|----------------|---------------------------|------------------------------------|--------------------|------------------|---------------|-------------------------------|
| 6 | 134 | 5 | 6 | 15 | 16.50 | 5.25 | 15 | 3 | 8 | 15 | 108 | 31.00 | 9.75 |
| 8 | 2 | 5 | 8 | 28 | 20.00 | 6.00 | 16 | 3 | 8 | 16 | 119 | 34.00 | 9.75 |
| 9 | 2 | 5 | 9 | 32 | 21.00 | 6.00 | 18 | 434 | 10 | 18 | 175 | 38.00 | |
| 10 | 2 | 5 | 10 | 36 | 24.00 | 6.00 | 21 | 434 | 10 | 21 | 208 | 48.00 | 14.25 |
| 12 | 3 | 7 | 12 | 7 6 | 27.50 | | 24 | 434 | 12 | 24 | 243 | 56.00 | 15.75 |
| 14 | 3 | 8 | 14 | 93 | 30.00 | 9.75 | l | | ! | | | | |

^{*}Approximate.

LATHE CHUCKS, ETC.

UNION EXTRA HEAVY CUTTING-OFF CHUCK



Fig. 6020A

WESTCOTT INDEPENDENT AND UNIVERSAL CUTTING-OFF CHUCK

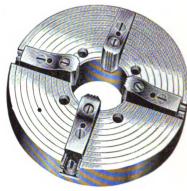


Fig. 6020B

UNION EXTRA HEAVY CUTTING-OFF CHUCKS

| Size Inches | Diameter of Body Inches | Center Hole Inches | Face Plate Recess Inches | Weight Pounds | Price Each |
|----------------|-------------------------------|-----------------------|--------------------------------|------------------|---------------|
| 9 | 101 8 | 21 3 | 5 | 39 | 40.00 |
| 11 | $12\frac{3}{8}$ | 31% | $7\frac{1}{4}$ | 60 | 50.00 |
| 14 | $15\frac{7}{6}$ | 41/8 | $81\frac{7}{4}$ | 99 | 60.00 |
| 17 | 18^{i_2} | $59\frac{3}{8}$ | 11 | 138 | 70.00 |

WESTCOTT INDEPENDENT AND UNIVERSAL CUTTING-OFF CHUCKS

| Diam. Inches | Center Hole Inches | Face Plate Recess Inches | Price Three Jaw Inches | Price Four Jaw Each | Diam. Inches | Center Hole Inches | Face Plate Recess Inches | Price Three Jaw Each | Price Four Jaw Each |
|-----------------|--------------------------|--------------------------------|------------------------------|---------------------------|-----------------|--------------------------|--------------------------------|----------------------------|---------------------------|
| 71/2 | 11/2 | 31, | 2 6.00 | 32.00 | 181/2 | 7 | 10 | 62.00 | 75.00 |
| 101 g | 25 g | 47/6 | 34.00 | 42.00 | 2117 | 9 | | 80.00 | 95.00 |
| 13!4 | 31/2 | 5^{9}_{16} | 44.00 | 56.00 | 24 | 12 | | 100.00 | 120.00 |
| 16 | 51/2 | $8^{1}_{.4}$ | 52.00 | 64.00 | | | ٠ | | |



Fig. 6020C

LATHE FACE PLATES

With Adjustable and Reversible Jaws

| Diameter . | | | 12 | 14 | 16 |
|------------|--------|-------|-------|-------|-------|
| Price | each | 13.00 | 15.00 | 17.00 | 19.00 |
| Diameter . | inches | 18 | 20 | 22 | 24 |
| Price | each | 22.00 | 26.00 | 30.00 | 33.00 |

LATHE CHUCKS

WESTCOTT

SPUR GEARED COMBINATION SCROLL CHUCK



I. X. L. INDEPENDENT REVERSIBLE JAWS



Fig. 5707A

Fig. 5707B

SPUR GEARED COMBINATION SCROLL

| Diameter Inches | Will Hold In- side of Jaw Inches | Face Plate Recess Inches | Price, Three- Jawed Chuck Each | Price, Four- Jawed Chuck Each | Price, Unfinished Face Plates Each |
|--------------------|--|--------------------------------|--------------------------------------|-------------------------------------|--|
| 6 | 61/2 | | 25.00 | 31.00 | .75 |
| 8 | 81/2 | 335 | 26.00 | 32.00 | .50 |
| 101/8 | 12 | 5 | 34.00 | 42.00 | 1.00 |
| 131/4 | 15 | 6 | 44.00 | 56.00 | 1.25 |
| 16 | 18 | $6\frac{3}{4}$ | 52.00 | 64.00 | 1.50 |
| 181/2 | 211/2 | 79/6 | 62.00 | 75.00 | 2.00 |
| $21)\sqrt{4}$ | 26 | $9\frac{1}{2}$ | 80.00 | 95.00 | 2.50 |
| 24 | 30 | 10 | 100.00 | 120.00 | 4.00 |
| 27 | 33 | $12\frac{3}{4}$ | 135.00 | 160.00 | 4,50 |
| 30 | 36 | $12\frac{3}{4}$ | 170.00 | 200.00 | 5.00 |
| 36 | 43 | 15 | 230.00 | 285.00 | 6.00 |

Spur Geared Chucks furnished as a strictly Universal Chuck at same prices.

I. X. L. INDEPENDENT

| Diameter Inches | Jaws Open Inches | Diam. Center Hole Inches | Face Plate Recess Inches | Weight Pounds | Price, with Three or Four Jaws, Each | Price, Unfinished Face Plate Castings, Each |
|--------------------|---------------------|--------------------------------|--------------------------------|-------------------|--|--|
| 4% | 51/2 | | 31/2 | 14 | 14.00 | .50 |
| 6 | 634 | $1\frac{3}{4}$ | 5_{16}^{9} | 22 | 18.00 | 1.00 |
| 8 | 9 * | 17% | 4716 | 39 | 22.00 | 1.00 |
| 101/8 | 12 | <u>5</u> ´° | 51_{2}^{16} | 51 | 26.00 | 1.25 |
| 12 8 | 15 | $\overline{2}_{1/2}$ | 5916 | 72 | 30.00 | 1.25 |
| 131/4 | 17 | $\frac{5}{3}$ | 61/2 | 88 | 32.00 | 1.50 |
| 14 | 18 | ž | 61/2 | 92 | 34.00 | 1.50 |
| 16 | 20 | 3 | 7916 | 139 | 38.00 | 2.00 |
| 181/2 | 23 | ĭ | 8 16 | 180 | 44.00 | 2.50 |
| $21\frac{1}{4}$ | 26 | Ī. | 91/2 | 228 | 55.00 | 3.50 |
| 24 | 30 | 434 | 10 | $\frac{240}{241}$ | 65.00 | 4.00 |
| $\tilde{27}$ | 33 | 43 | 123 | 400 | 95.00 | 4.50 |
| 30 | 36 | 3.4 | 1234 | 447 | 120.00 | 5.00 |
| 36 | 43 | 714 | 15 | 650 | 210.00 | 6.00 |

Three Jawed Independent Chucks above 1812 inches in diameter made to order only. This chuck can be used as a face plate by removing the jaws.

SKINNER LATHE CHUCKS, ETC.

INDEPENDENT No. 900
WITH SOLID REVERSIBLE JAWS
HALF NUT



INDEPENDENT No. 100 FOUR REVERSIBLE JAWS FULL THREADED NUT

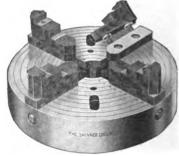


Fig. 6328A

INDEPENDENT No. 900

Fig. 6328B

| Number | Rated Size Inches | Will Hold Inches | Shipping Weight Pounds | Price Each | Number | Rated Size Inches | Will Hold Inches | Shipping Weight Pounds | Price Each |
|--------|-------------------------|------------------------|------------------------------|---------------|--------|-------------------------|------------------------|------------------------------|---------------|
| 904 | 41/2 | 6 | 10 | 14.00 | 918 | 18 | 21 | 175 | 44.00 |
| 906 | 6 | 71/2 | 17 | 18.00 | 920 | 20 | 23 | 195 | 50.00 |
| 908 | 8 | 91/2 | 34 | 22.00 | 921 | 21 | 24 | 215 | 55.00 |
| 909 | 9 | $11\frac{1}{2}$ | 42 | 24.00 | 922 | 22 | 25 | 226 | 57.00 |
| 910 | 10 | $12\frac{1}{2}$ | 49 | 26.00 | 924 | 24 · | 27 | 270 | 65.00 |
| 912 | 12 | $14\frac{1}{2}$ | 80 | 30.00 | 926 | 26 | 29 | 315 | 80.00 |
| 914 | 14 | 161/2 | 105 | 34 .00 | 928 | 28 | 31 | 340 | 100.00 |
| 915 | 15 | 18 | 122 | 36.00 | 930 | 30 | 35 | 485 | 120.00 |
| 916 | 16` | 19 | 133 | 38.00 | 936 | 36 | 41 | 715 | 210.00 |

INDEPENDENT No. 100

| Number | Rated Size Inches | Will Hold Inches | Shipping Weight Pounds | Price Each | Number | Rated Size Inches | Will Hold Inches | Shipping Weight Pounds | Price Each |
|--------------|-------------------------|------------------------|------------------------------|---------------|--------|-------------------------|------------------------|------------------------------|---------------|
| 103J | 3 | 334 | 6 | 12.00 | 120J | 20 | 221,2 | 160 | 50.00 |
| 104J | 4 | 434 | 10 | 14.00 | 122J | 22 | 2437 | 200 | 57.00 |
| 106J | 6 | 8 | 22 | 18.00 | 124J | 24 | $283\frac{7}{4}$ | 240 | 65.00 |
| 108 J | 8 | 914 | 30 | 22.00 | 126J | 26 | 3034 | 340 | 80.00 |
| 110 J | 10 | 1034 | 45 | 26.00 | 128J | 28 | 33 | 400 | 100.00 |
| 112J | 12 | 1313 | 65 | 30.00 | 130J | 30 | 341/2 | 480 | 120.00 |
| 114J | 14 | 1517 | 80 | 34.00 | 136J | 36 | 3712 | 580 | 210.00 |
| 116J | 16 | 1814 | 100 | 38.00 | 142J | 42 | 421/2 | 620 | 240.00 |
| 118J | 18 | 2013 | 125 | 44.00 | | | | 1 | |

Three jaw chucks can be furnished if desired.

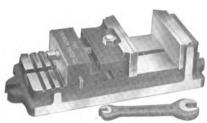


Fig. 6328C

DRILL PRESS VISES

| Sizeinches | 41/2 | 51.5 |
|-----------------------------|--------|-------|
| Width of Jawsinches | 41/2 | -5i., |
| Depth " " " | 2 | 2 - |
| Jaws Open " | 5 | 6 |
| Space Required " | 14x5!4 | 15x6 |
| Approx. Shipping Wt. pounds | 35 | 45 |
| Priceeach | 15.00 | 18.00 |
| | | |

A forged steel wrench is furnished with each vise.



SKINNER LATHE CHUCKS WITH PATENT REVERSIBLE JAWS, STYLE J, GEARED SCREW UNIVERBAL COMBINATION







Fig. 9898B

| | | UNIV | ERSAL | | |
|-----------|----------|----------------|----------------|-----------|----------|
| Num | IBER | Rated | Will | Price, | Еасн |
| Three Jaw | Four Jaw | Size Inches | Hold Inches | Three Jaw | Four Jaw |
| 303J | | 3 | 3¾ | 18.00 | |
| 304J | 404J | 4 | 41/6 | 22.00 | 26.00 |
| 305J | 405J | 5 | 53/4 | 25.00 | 30.00 |
| 306J | 406J | 6 | 71/4 | 26.00 | 32.00 |
| 308J | 408J | 8 | 85/8 | 30.00 | 38.00 |
| 309J | 409J | 9 | 91/2 | 34.00 | 42.00 |
| 312J | 412J | 12 | 127/8 | 44.00 | 56.00 |
| 315J | 415J | 15 | 165/8 | 52.00 | 64.00 |
| 318J | 418J | 18 | 183/8 | 62.00 | 75.00 |
| 321J | 421J | 21 | 211/4 | 80.00 | 95.00 |
| 324J | 424J | 24 | 25 | 100.00 | 120.00 |
| 326J | 426J | 26 | 281/2 | 130.00 | 160.00 |
| 330J | 430J | 30 | 3134 | 170.00 | 200.00 |
| 336J | 436J | 36 | 37 | 230.00 | 285.00 |
| 342J | 442J | 42 | 421/4 | 270.00 | 325.00 |
| | | COMBI | NATION | | |
| 603J | | 3 | 33/4 | 18.00 | |
| 604J | 804J | 4 | 41/16 | 22.00 | 26.00 |
| 605J | 805J | 5 | 53/4 | 25.00 | 30.00 |
| 606J | 806J | 6 | 71/4 | 26.00 | 32.00 |
| 608J | 808J | 8 | 85/8 | 30.00 | 38.00 |
| 609J | 809J | 9 | 91/2 | 34.00 | 42.00 |
| 612J | 812J | 12 | 12% | 44.00 | 56.00 |
| 615J | 815J | 15 | 165/8 | 52.00 | 64.00 |
| 618J | 818J | 18 | 183/8 | 62.00 | 75.00 |
| 621J | 821J | 21 | 211/4 | 80.00 | 95.00 |
| 624J | 824J | 24 | 25 | 100.00 | 120.00 |
| 626J | 826J | 26 | 281/2 | 130.00 | 160.00 |
| 630J | 830J | 30 | 313/4 | 170.00 | 200.00 |
| 636J | 836J | 36 | 37 | 230.00 | 285.00 |
| 642J | 842J | 42 | 4214 | 270.00 | 325.00 |

A universal lathe chuck is one in which the jaws are all operated at once, moving to and from the center together and having a common center at all times.

A combination chuck is a combination of a universal and an independent chuck. The jaws work universally to and from the center, but by shifting a stud on the back of chuck, throwing the gears out of mesh, the jaws work independently.

Can be furnished with other style of jaws as required.

SKINNER LATHE CHUCKS

No. 27 UNIVERSAL BOX BODY WITH SLIP JAWS



Fig. 9965A

| Nominal Size and Length of Bodyinches | 7 | 9 | 12 | 15 | 18 |
|---|-------|-------|-------|-------|-------|
| Width of Bodyinches | 31.4 | 4 | 41/2 | 5 | 55/8 |
| " " Jaws " Face of Body to Top of Jaws " Price each | 13/4 | 2 | 21/4 | 21/4 | 21/4 |
| Face of Body to Top of Jaws " | 134 | 2 | 278 | 31/2 | 6 |
| Priceeach | 24.00 | 30.00 | 36.00 | 42.00 | 60.00 |
| " Extra Mach. Steel Slip Jaws " | 1.00 | 1.25 | 1.25 | 1.50 | 2.00 |

Chuck with hub for threading to screw on lathe spindle can be furnished if desired. Above also furnished in Independent pattern No. 28.

WITH SLIP JAWS

ROUND BODY

WITH V GROOVED JAWS



Fig. 9965B



Fig. 9965C

WITH SLIP JAWS

| Nominal Sizeinches | 416 | 6 | 7 | 9 | 12 |
|------------------------------------|------|--|----------------------|-------|---------------|
| Priceeach " Extra Tool Steel Jaws" | | $\begin{array}{c c} 20.00 \\ 2.00 \end{array}$ | $\frac{24.00}{2.00}$ | 30.00 | 36.00 4.00 |
| " " Mach. Steel Jaws " | 1.00 | 1.00 | 1.00 | 1.25 | 1.25 |

Furnished in Universal pattern No. 22 or Independent pattern No. 24.

WITH V GROOVED JAWS

| Nominal Sizeinches 4½ | 6 | 7 | 9 | 12 |
|---------------------------|-------|-------|-------|-------|
| Diameter Bodyinches 412 | - 6 | 7 | 8 | 12 |
| Thickness " | 27.4 | 35/6 | 31/4 | 31/4 |
| Diameter Hole " 1 | 114 | 11/2 | 13/4 | 214 |
| " Face Plate Recess " 41% | 55% | 611/2 | 611/2 | 91/2 |
| Price | 20.00 | 24.00 | 30.00 | 36.00 |

Furnished in Universal pattern No. 21 or Independent pattern No. 23 with recess for face plate.

UNION BOX BODY CHUCKS

No. 26. TWO-JAWED WITH SLIP JAWS





COLUMN TO A STATE OF THE PARTY

F18. Z100A

TWO-JAWED WITH SLIP JAWS With hub to be threaded to fit spindle of lathe.

| Size | . | in | ches | 7 | 9 | 12 | 15 | 18 |
|--------|-----------|--------|------|-------|-------|-------|-------|-------|
| Price. | | | each | 24.00 | 30.00 | 36.00 | 42.00 | 60.00 |

No. 66 WITH RECESS

With face-plate recess to be fitted to face-plate. For most work this chuck is preferable to that with threaded hub.

| Sizeinches | | - | | 15 | 18 |
|---|-------|-----------|--------|-------|-------|
| Diameter of Face-Plate Recess inches Price each | 311 | 5 1 20 00 | 36 00 | 42 M | 71/2 |
| Thebeach | 24.00 | 50.00 | ا00.00 | 42.00 | 00.00 |

We can furnish these chucks with jaws operating independently when so ordered.

ROUND BODY CHUCKS TWO JAWS WITH V GROOVE

No. 40 WITH SLIP JAWS

Fig. 2155B







Fig. 2155D

No. 38 is a round body chuck with operating screw on side of jaw. Unobstructed hole through center of chuck. Especially adapted for holding pipe, tube, etc. No. 40, same as No. 38, but is equipped with slip jaws.

| Diameterinches | 41/2 | 6 | 7 | 9 | 12 | 15 |
|--|-------|-------|-------|-------|-------|-----------------|
| Diameter of Holeinches | 1 | 154 | 11/2 | 2 | 23/8 | $-3\frac{1}{2}$ |
| Diameter of Hole inches Price, No. 38 each | 12.00 | 18.00 | 24.00 | 30.00 | 36.00 | 42.00 |
| " 40 " | 16.00 | 20.00 | 24.00 | 30.00 | 36.00 | 42.00 |

We can furnish these chucks with jaws operating independently when so specified.

FACE PLATE JAWS





Fig. 6355A

| Sizeinches | 6 | 8 | 10 | 12 | 14 |
|-----------------------------------|----------------|-----------|----------------|------------------------|--------|
| Length of Bodyinches | 6 | 8 | 10 | 12 | 14 |
| " Over All " | 91/2 | 1113/6 | 141/4 | 163/8 | 185/8 |
| Height of Body " | $3\sqrt{4}$ | 4 | 4½ 4½ 7¼ | | 5 |
| Width " " " | 314 | 41/4 | 41/2 | 4½ 4½ | 45/8 |
| Length "Sliding Jaw" " | $5\frac{1}{2}$ | $6^{1/2}$ | 71/4 | 714 | ý |
| Width " " " | 158 | 2 | 2^{T} | $\mathbf{\hat{2}}^{-}$ | 2 |
| Weight per Set of Four Jawspounds | 100 | 185 | 240 | 270 | 375 |
| Price per Set of Three | 36.00 | 45.00 | 60.00 | 90.00 | 120.00 |
| " " " Four | 48.00 | 60.00 | 80.00 | 120.00 | 160.00 |

There is a rib 1¼-inch wide on the bottom of these jaws cast solid with body, which can be fitted to slot in face plate.

CUSHMAN

TOP VIEW



Fig. 6355B

BOTTOM VIEW



Fig. 6355C

| Sizeinches | 6 | 8 | 10 | 12 | 14 |
|-----------------------|----------------|---------------------------|------------|--------|--------|
| Length of Bodyinches | 6 | 8 | 10 | 12 | 14 |
| " Over All " | 71/4 | 95/8 | 12 | 14 | 16 |
| Height of Body " | 3 | 31/8 | 4 | 41/2 | 47/8 |
| Width " " " | 31/4 | 31/2 | 41/4 | 5 | 55/8 |
| Length "Sliding Jaw " | 43/8 | 5 | 6 | 71/8 | 8 |
| Width " " " | $1\frac{1}{2}$ | $\frac{1\frac{1}{2}}{23}$ | 13/4 40 | 2 | 21/4 |
| Weight Completepounds | 15 | 23 | 40 | 60 | 100 |
| Priceeach | 12.00 | 15.00 | 20.00 | 30.00 | 40.00 |
| " per Set of Three | 36.00 | 45.00 | 60.00 - | 90.00 | 120.00 |
| " " " Four | 48.00 | 60.00 | 80.00 | 120.00 | 160.00 |

PLANER CHUCKS

SKINNER

ROUND SWIVEL BASE









Fig. 5705B

| | R | OUND SWIVE | | Squ | ARE BASE | Сниск | | |
|----------------------|---------------|-----------------------|---|------------------------------|-----------------------------|----------------------|---------------|-----------------------------|
| Size Chuck No. | Price Each | Length of Jaw *Inches | Depth of Jaw *Inches | Jaws will Open *Inches | Space Required Inches | Size Chuck No. | Price Each | Space Required Inches |
| 6 | 25.00 | 7 | 11/2 . | 31/2 | 10 | 6 | 20.00 | 71/4×11 |
| 8 | 30.00 | 9 | $17\frac{7}{8}$ | 5 | 111/2 | 8 | 25.00 | 9 x121/2 |
| 10 | 36.00 | 11 | 238 | 6 | 14 | 10 | 30.00 | 11 x15 |
| 12 | 40.00 | 13 | 23/8 | 8 | 16 | 12 | 35.00 | 13 x17 |
| 15 | 50.00 | 151/2 | $2\frac{1}{2}$ | 91/2 | 20 | 15 | 45.00 | 15½x21 |
| 18 | 60.00 | 181/2 | $2\overset{\circ}{,}\overset{\circ}{4}$ | 1114 | 22 | 18 | 55.00 | $18\frac{1}{2}$ x24 |
| 24 | 90.00 | 2414 | 2^{3}_{4} | 16 | 26 | 24 | 75.00 | 24 ¼ x28 |
| 30 | 140.00 | 301/4 | 3 | 211/2 | 3 3 | 30 | 120.00 | $30\frac{1}{2} \times 34$ |

^{*}Round Swivel Base and Square Base, same dimensions.

Round Base Chucks have a rib 114 inches wide cast on bottom. For fitting the rib for planer table, extra charge is made. A wrench is furnished with each Chuck.

MASSEY'S PLANER, MILLING AND DRILL PRESS



Fig. 5705C

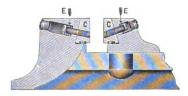
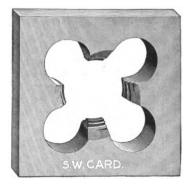


Fig. 5705D

| Number | 41 | 42 | 43 | 44 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 |
|--------------------|-------|---------|----------------|-------|-------|-----------------|-------|-----------------|-------|-------|-------|-------|-------|
| Width of Jawinches | 4 | 4 | $\overline{5}$ | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 |
| Jaw Opens. " | 914 | 91/4 | 1134 | 1134 | 91/2 | $11\frac{1}{2}$ | 131/2 | $15\frac{1}{2}$ | 9 | 11 | 13 | 15 | 15 |
| Depth of Jaw " | 117 | 2^{-} | 11/2 | 3 | 2 | 2 | 2 | 2^{-} | 3 | . 3 | 3 | 3 | 3 |
| Weight pounds | 36 | 42 | 65 | 75 | 150 | | | 195 | 165 | | | 210 | 250 |
| Priceeach | 15.00 | 17.00 | 20.00 | 25.00 | 45.00 | 47.00 | 49.00 | 51.00 | 47.00 | 49.00 | 51.00 | 53.00 | 57.00 |

MACHINE OR SOLID BOLT DIES



Pig. 2489A

| Cutting Size Inches | U.S. Stand- ard | Threads to Inch V Standard | Size of Square Inches | Thick- ness Inches | Price Each | Size Inches | Thrds- to Inch U. S. Stand- ard | Standard | Size of Square Inches | Thick- ness Inches | Price Each |
|--|-----------------------|-------------------------------------|---|---|---------------|-------------------------------|---|---------------------------------|-----------------------------|--------------------------|---------------|
| 1/4 | 20 | 20 | $2\frac{1}{2}$ | 1/2 | 1.80 | 7/8 | 9 | 9 | 21/2 | 3/4 | 2.40 |
| 17 | 20 | 20 | 21/2 | 1/2 | 1.80 | 1 33 | 9 | 9 | 21/2 | 3/4 8/4 | 2.40 |
| 32 | 20 | 20 | 21/2 | 1/2 | 1.80 | 15/6 | 9 | 9 | $2\frac{1}{2}$ | 3/4 | 2.55 |
| 5/6 | 18 | 18 | 21/2 | 1/2 | 1.80 | 31 | 9 | 9 | $2\frac{1}{2}$ | 3/4 | 2.55 |
| 21 | 18 | 18 | 21/2 | 1/2 | 1.80 | 1 | 8 | 8 | 21/2 | 1 | 2.70 |
| 11 | 18 | 18 | 21/6 | 1/2 | 1.80 | $1_{\frac{1}{32}}$ | 8 | 8 | $2\frac{1}{2}$ | 1 | 2.70 |
| The one was the control of the contr | 16 | 16 | $2\frac{1}{2}$ | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 1.80 | 11/6 | 8 | 8 8 8 7 | $2\frac{1}{2}$ | 1 | 2.85 |
| 25 | 16 | 16 | 21/2 | 1/2 | 1.80 | 11/6 | 7 | | $2\frac{1}{2}$ | 1 | 3.00 |
| 13 | 16 | 16 | 21/6 | 1/2 | 1.80 | 1 3 1 3 1 6 | 7 | 7 | $2\frac{1}{2}$ | 1 | 3.00 |
| 7/6 | 14 | 14 | $2\frac{1}{2}$ | 1/2 | 1.80 | 13/6 | 7 | 7 | $2\frac{1}{2}$ | 1 | 3.15 |
| 29 | 14 | 14 | 1 21/2 | 1/2 | 1.80 | 11/4 | 7 | 7 | 21/6 | 1 | 3.30 |
| 15 | 14 | 14 | 21/6 | 1/3 | 1.80 | $1\frac{9}{32}$ | 7 | 7 | 21/2 | 1 | 3.30 |
| 1/2 | 13 | 12 | 21/3 | 3 7 | 1.80 | 15/6 | 7 | 7 | 21/2 | 1 1 | 3.45 |
| 33 | 13 | 12 | 1 21/5 | 3/4 | 1.80 | 18/8 | 6 | 6 | 21/6 | 1 | 3.60 |
| $\frac{17}{32}$ | 13 | 12 | $\begin{array}{c c} 2\frac{1}{2} \\ 2\frac{1}{2} \end{array}$ | 34 | 1.80 | 133 | 6 | 6 6 6 5 5 5 5 | $2\frac{1}{2}$ | 1 | 3.60 |
| 916 | 12 | 12 | $2\frac{1}{2}$ | 34 | 1.90 | 11 1 1 1 1 1 | 6 | 6 | 21/2 | 1 | 3.75 |
| 37 | 12 | 12 | 21/3 | 3/4 | 1.90 | $1\frac{1}{2}$ $1\frac{1}{3}$ | 6 | 6 | 3 - | 1 | 3.90 |
| 19 32 | 12 | 12 | 21/3 | 3/4 | 1.90 | 133 | 6 | 6 | 3 | 1 | 3.90 |
| 5 8 | 11 | 11 | 21/51 | $3\frac{7}{4}$ | 2.00 | $\parallel 156 \parallel$ | $5\frac{1}{2}$ | 5 | 3 3 3 | 1 | 4.20 |
| 41 | 11 | 11 | 21/6 | 34 34 34 34 | 2.00 | $1\frac{21}{32}$ | 51/2 | 5 | 3 | 1 | 4.20 |
| 312 11 / 6 | 11 | 11 | $\frac{21\frac{7}{2}}{21\frac{7}{2}}$ | 34 | 2.00 | 13/4 | 5 | 5 | 3 | 11/4 | 5.40 |
| 117 | 11 | 11 | $2\frac{1}{2}$ | 3/4 | 2.15 | 135 | 5 | 5 | 3 | 11/4 | 5.40 |
| 33 | 11 | 11 | 21/2 | 34 | 2.15 | 17/8 | 5 | 41/2 | 31/2 | 11/2 | 6.50 |
| 3/4 | 10 | 10 | 213 | 34 | 2.25 | $1\frac{29}{32}$ | 5 | 41/2 | $31\frac{7}{2}$ | 11/2 | 6.50 |
| 33 | 10 | 10 | 21/3 | 31 | 2.25 | 2 | 41., | 41/6 | 337 | 2 | 7.50 |
| 2001 4 500 1 6 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 10 | 10 | $21\frac{1}{2}$ | 32 | 2.30 | $2_{32}^{}$ | 412 | $4\frac{1}{2}$ | 334 | 2 | 7.50 |
| 37 | 10 | 10 | $2^{1}rac{7}{2}$ | 3/4/4/4/4/4/4/4/4/4/4/4/4/4/4/4/4/4/4/4 | 2.30 | "- | | | | | |

All orders for Solid Bolt Dies will be filled with U. S. Standard Threads, unless otherwise specified.

Sizes and threads not listed subject to special prices. Left-hand solid bolt dies are special.

LITTLE GIANT SINGLE STOCKED SCREW PLATES

ASSORTMENT No. 5

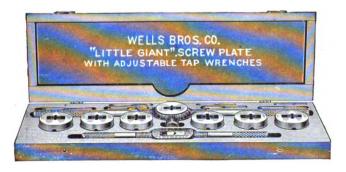


Fig. 6546A



Fig. 6546B

| Num- ber | Length of Stock Inches | Diameter of Collet Inches | Size Taps and Dies in Each Set | Price per Set |
|--|---|--|---|--|
| A 1 A 2 A 3 A10 A12 A14 1 2 3 4 5 5 7 7 | 7½ 7½ 7½ 7½ 7½ 7½ 1½ 13½ 13½ 14½ 23 26 26 26 23 23 26 26 26 | 114 114 114 114 114 and 15 \(13\) 3 15 \(\) 2 23 \(4 \) 24 \(4 \) 2 | $\begin{array}{c} 1\\ 1\\ 2\\ 40\\ 3\\ 5\\ 6\\ 8\\ 3\\ 8\\ 3\\ 6\\ 3\\ 6\\ 3\\ 8\\ 3\\ 6\\ 3\\ 3\\ 8\\ 3\\ 6\\ 3\\ 3\\ 8\\ 3\\ 6\\ 3\\ 3\\ 8\\ 3\\ 3\\ 6\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\ 3\\$ | 6.50 8.00 10.50 11.50 12.75 6.25 12.00 13.50 15.00 17.50 16.00 18.50 22.00 25.50 28.00 |

Each assortment is put up in a neat case and has an adjustable tap wrench for holding taps.

Taps and Dies, unless otherwise ordered, will be furnished with U. S. Standard thread, but V threads oversize will be furnished when specified, at the same prices.

LITTLE GIANT SINGLE STOCKED SCREW PLATES

ASSORTMENT No. 9



Fig 6545A

ASSORTMENT No. 50

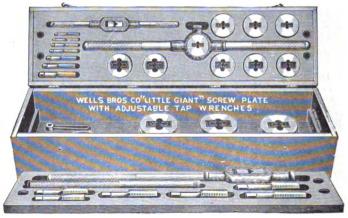


Fig. 6545B

| Num- ber | Length of Stock Inches | Diameter of Collet Inches | Size Taps and Dies in Each Set | Price per Set |
|----------------|--|---|---|-------------------------|
| 8 9 | $14\frac{1}{2}$ and 26 $14\frac{1}{2}$ " 29 | | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 18.00 27.50 |
| 20 25 30 | $egin{array}{c} 40 \ 52 \ 52 \end{array}$ | 4 412 415 | [*, *, *, *, *, *, *, *, *, *, *, *, *, * | 35.00 45.00 37.50 |
| 40 50 | 23 and 40 26 " 52 | $\frac{2^34}{2^3}$ and $\frac{4}{4^{12}}$ | 1,20, 5,615, 3, 16, 7,616, 1,513, 5,511, 3,410, 7,50, 18, 11,67, 11,47, | 40.00 60.00 |

Each assortment is put up in a neat case and has an adjustable tap wrench for holding taps.

Taps and dies, unless otherwise ordered, will be furnished with U. S. Standard thread, but V threads over size will be furnished when specified, at the same prices.

LITTLE GIANT FULL MOUNTED SCREW PLATES

A STOCK FOR EACH SIZE

ASSORTMENT No. 61

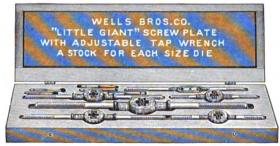


Fig. 6547A

ASSORTMENT No. 67

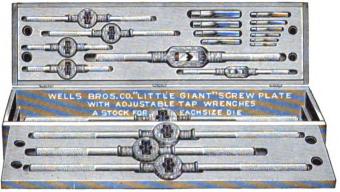


Fig. 6547B

| Num- ber | Size of Taps and Dies in Each Set | Price per Se |
|-------------|--|-----------------|
| 61 | $\frac{1}{4}^{20}, \frac{5}{16}^{18}, \frac{3}{8}^{16}, \frac{7}{16}^{14}, \frac{1}{2}^{13}$ | 12.00 |
| 62 | $1\frac{1}{4}^{20}, \frac{3}{8}^{16}, \frac{1}{2}^{13}, \frac{5}{8}^{11}, \frac{3}{4}^{10}$ | 15.50 |
| 63 | 5811, 3410, 789, 18 | 17.00 |
| 64 | $\frac{1}{2}$ $\frac{13}{5}$ $\frac{5}{8}$ $\frac{11}{3}$ $\frac{3}{4}$ $\frac{10}{9}$ $\frac{7}{8}$ $\frac{18}{1}$ | 19.50 |
| 65 | $1\frac{7}{4}, \frac{7}{6}, \frac{7}{6}, \frac{18}{3}, \frac{3}{16}, \frac{7}{76}, \frac{14}{76}, \frac{1}{2}, \frac{13}{5}, \frac{5}{8}, \frac{11}{34}, \frac{3}{4}$ | 18.0 |
| 651/2 | $14^{20}, 56^{18}, 38^{10}, 76^{14}, 12^{13}, 96^{12}, 58^{11}, 34^{10}$ | 20.5 |
| 66. | $\frac{3}{8}$ 16, $\frac{7}{16}$ 14, $\frac{1}{2}$ 13, $\frac{5}{8}$ 11, $\frac{3}{4}$ 10, $\frac{7}{8}$ 9, $\frac{1}{8}$ 18 | 24.0 |
| 67 | $1\sqrt[4]{20}, 5\sqrt[5]{18}, 3\sqrt[8]{16}, 7\sqrt[6]{14}, 1\sqrt[2]{13}, 5\sqrt[8]{11}, 3\sqrt[4]{10}, 7\sqrt[8]{9}, 1^8.$ | 29.5 |
| 671/2 | $1\frac{7}{4}$ 20, $5\frac{18}{16}$, $3\frac{3}{8}$ 16, $7\frac{14}{16}$ 14, $1\frac{7}{2}$ 13, $9\frac{12}{16}$ 2, $5\frac{5}{8}$ 11, $3\frac{7}{4}$ 10, $7\frac{9}{8}$ 9, 1^{8} | 32.0 |
| 620 | 5/11, 3/10, 7/9, 18, 11/8, 11/1 | 40.0 |
| 625 | $7_8^{\circ}, 1^8, 11_8^{\circ}, 11_4^{\circ}, 13_8^{\circ}, 11_2^{\circ}$ | 50.0 |
| 630 | $1\frac{1}{8}$, $1\frac{1}{4}$, $1\frac{3}{8}$, $1\frac{1}{2}$ | 43.5 |
| 640 | $1/4^{20}, 5/6^{18}, 3/8^{16}, 7/6^{14}, 1/2^{13}, 5/8^{11}, 3/4^{10}, 7/8, 18, 11/8^7, 11/4^7$ | 47.0 |
| 650 | $1\frac{1}{4}^{20}, \frac{5}{6}^{6}, \frac{18}{8}, \frac{3}{8}^{16}, \frac{7}{6}^{614}, \frac{1}{2}^{2}, \frac{13}{5}, \frac{5}{8}^{11}, \frac{3}{4}^{10}, \frac{7}{8}^{9}, \frac{18}{1}^{8}, \frac{11}{8}^{7}, \frac{11}{4}^{7}, \frac{13}{8}^{6}, \frac{11}{2}^{6} \dots $ | 67.0 |

Each assortment is put up in a neat wood case and has an adjustable tap wrench for holding taps.

All taps and dies, unless otherwise ordered, are furnished with U.S. Standard threads V form threads will be furnished when specified at the same price.

ADJUSTABLE BOLT STOCKS AND DIES

ARMSTRONG'S



HART'S



Fig. 7082A

Fig. 7082B

ARMSTRONG'S

| Number | | Price, per Set |
|----------|--|----------------|
| <u> </u> | 7 Bolt Dies 14 to 34-inch | 15.00 |
| · 1 | 4 Pipe and 7 Bolt Dies | 20.00 |
| 1 | 7 Bolt Dies and Taps, 14 to 34-inch | 20.50 |
| 1 | 4 Pipe " 7 Bolt Dies and Taps | 25.50 |
| 2 | 11 Bolt Dies, ¼ to 1¼ inches | 30.00 |
| 2 | $[7 " "]_{\frac{1}{2}} "]_{\frac{1}{4}} " \dots$ | 20.00 |
| 2 | 7 " " $\frac{12}{2}$ " $\frac{114}{4}$ " | 28.50 |
| 2 | 7 " " and Taps, $\frac{1}{2}$ to $\frac{1}{4}$ inch | 32.00 |
| 2 | 7 " " $\frac{1}{2}$ " $\frac{1}{4}$ " and 5 Pipe Dies, $\frac{1}{4}$ to 1 inch | 40.00 |

PRICES OF PARTS OF ARMSTRONG'S STOCKS

| No. 1 Dies, 14, 26, 38, 76 in. " 1 " 12, 58, 34 in. | | each 1.5 |
|--|------|----------|
| " 2 " 1½, 5%, 3½, 7%, 1½, 5%, 34, 7%, 1 in " 2 " 1½, 11¼ in | | " 2 (|
| Stocks for Sets Number | | 2 |
| Price each | 3.25 | 4.00 |

HART'S

The quick-opening feature of the dies in these tools is especially valuable, as there is a great saving of time by releasing them from finished work without being obliged to turn back over the long threads on bolts, very easy to vary the sizes of threads over the ordinary round or split dies. Dies can be set immediately to thread standard sizes, or any over or under size. Cut free and easy, being easily sharpened.

| Size of Die Stock Set | Size Dies and Taps in Each Set | Sets of Dies | No. of Taps | Com- | Extra Dies per Single Set (4 Pcs.) |
|--|---|--------------------|-------------------|-----------------------|--|
| AA A | $\frac{3}{16}^{24}, \frac{1}{4}^{20}, \frac{5}{16}^{16}, \frac{3}{8}^{16}, \frac{7}{16}^{14}, \frac{1}{2}^{12}$, $\frac{1}{2}^{20}, \frac{5}{16}^{18}, \frac{3}{8}^{16}, \frac{7}{16}^{14}, \frac{1}{2}^{12}$, $\frac{3}{6}^{11}, \frac{3}{4}^{10}$ | 6 7 | 6 7 | $15.00 \\ 20.00$ | 1.00 1.25 |
| $_{ m B2}^{ m B}$ | $\begin{array}{c} 1^{20}, 5/6^{18}, \frac{8}{8}1^{6}, 7/6^{14}, \frac{1}{2}1^{2*}, \frac{5}{8}1^{1}, \frac{8}{4}1^{0}, \frac{7}{8}^{9}, 1^{8} \\ 1^{12*}, \frac{5}{8}1^{1}, \frac{2}{4}1^{0}, \frac{7}{8}^{9}, 1^{8} \end{array} \ . \ldots \ .$ | 9 | | $\frac{30.00}{22.00}$ | 1.50 1.50 |
| B3** | $\frac{3}{16}^{24}, \frac{120}{4}^{20}, \frac{5}{16}^{18}, \frac{3}{8}^{16}, \frac{3}{16}^{16}, \frac{1}{16}^{14}, \frac{1}{2}^{12}, \frac{5}{8}^{11}, \frac{3}{4}^{10}, \frac{79}{8}, \frac{1}{8} \dots$ | | | 35.00 | |
| BB BB2** | $\begin{array}{c} \frac{1}{2} 1^{12} *, \frac{5}{5} 1^{1}, \frac{3}{4} 1^{0}, \frac{79}{5}, 1^{8}, 1\frac{18}{8}, 7\frac{14}{4} 7 \\ \frac{1}{4} 2^{0}, \frac{5}{4} 6^{18}, \frac{3}{8} 1^{6}, \frac{7}{4} 6^{14}, \frac{1}{2} 1^{2} *, \frac{5}{5} 1^{1}, \frac{3}{4} 1^{0}, \frac{79}{8}, 1^{8}, 1\frac{1}{8}^{7}, 1\frac{1}{4}^{7} \\ \end{array}$ | 6 | 11 | 37.00 48.00 | 1.75 |
| $\begin{array}{c} \mathrm{C} \\ \mathrm{C2} \end{array}$ | $\frac{1}{2}^{12}$ *, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{0}$, $\frac{1}{8}^{8}$, $\frac{1}{18}^{17}$, $\frac{1}{4}^{17}$, $\frac{1}{8}^{8}$, $\frac{1}{2}^{16}$ | 7 | 9 | $45.00 \\ 40.00$ | 1.75 1.75 |
| C3** | [4 | 11 | 13 | 57.00 | 1.75 |

*Sets with United States standard threads are furnished with ½-inch 13 threads.

**The sets B3, BB2, and C3 are combination sets containing two sizes of die stocks.

TAP WRENCHES

NEW LIGHTNING ADJUSTABLE TAP WRENCHES



Fig. 5760A

| Number | 51 | 52 | 53 | 54 | 55 | 56 |
|---------------------------------------|---------------|-----------------|------------------|----------------|------|------------------|
| Length inches Holds Taps " Price each | 7 up to 14 | 10½ 34 to 16 | 16 1/4 to 3/4 | 21 1/2 to 1 | 26 | 34 % to 1 1/6 |
| Priceeach | 1.35 | 2.15 | 2.75 | 3.50 | 4.75 | 6.00 |

No. 206 CARD'S TAP WRENCHES



Fig. 5760 B

| Number | 0 1 1½ | 2 | 3 | 4 | 5 |
|------------------------------------|--|--|-----------------------|--------------------------|--------------------------|
| Lengthinches Holds Taps" Priceeach | $\begin{vmatrix} 5 \\ \frac{1}{16} \text{ to } \frac{3}{16} \end{vmatrix} \begin{vmatrix} 7\frac{1}{2} \\ \frac{1}{8} \text{ to } \frac{3}{3} \\ 1.50 \end{vmatrix} \begin{vmatrix} \frac{9\frac{1}{2}}{1} \\ \frac{3}{16} \text{ to } \frac{1}{2} \\ \frac{2}{1} \end{vmatrix} = 0$ | $12 \\ 14 \text{ to } \frac{5}{8} \\ 2.00$ | 14 ½ to 34 3.00 | 19 34 to 11/8 4.00 | 24 7/stol 1/2 5.25 |

HORSFIELD TAP AND REAMER WRENCH

HANDY TAP WRENCH



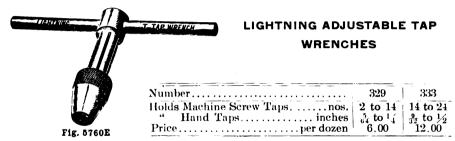
Fig. 5760C

Fig. 5760D

HORSFIELD TAP AND REAMER WRENCHES

| Number | . 6 | 7 | 8 | 9 | 10 | 12 |
|-----------------------|----------|-------------------|------------------|-------------------|----------------------------------|----------|
| Lengthinche | | 11 | 15 | 20 | 30 | 40 |
| Holds Taps | 16 to 14 | % to 1/2 | 14 to 34 | 3 g to 1 | $\frac{11}{2}$ to $\frac{11}{2}$ | 114to214 |
| Holds Taps " Priceeac | 1 + 1.50 | $\frac{76}{2.00}$ | $\frac{1}{2.50}$ | $\frac{78}{3.50}$ | 7.00^{19} | 16.00 |

HANDY TAP WRENCHES



WRENCHES

COES' "KNIPE HANDLE"





Fig. 8693A Fig. 8693B "KNIEE

| | UES | DANL | <u> </u> | | | | |
|--|-----|---|---------------------|------------------------|---|----------------|---|
| Sizeinches | 6 | 8 | 10 | 12 | 15 | 18 | 21 |
| Opensinches Price, Blackper dozen "Bright" | | $ \begin{array}{c c} 1^{1}4 \\ 10.00 \\ 12.50 \end{array} $ | 134 12.00 15.00 | 21 8 14.00 19.00 | $\begin{array}{r} 25\% \\ 24.00 \\ 30.00 \end{array}$ | 30.00 36.00 | $ \begin{array}{r} 41 & 6 \\ 36.00 \\ 42.00 \end{array} $ |

COES' ALL STEEL 10 12 15 18 21 6 Size.....inches 4 Price Blackper dozen 8.00 9.00 10.00 12.00 14.00 24.00 30.00 36.00

All Steel Wrenches, 12, 15, 18, and 21 inches long are Ball Bearing.

STILLSON PIPE WRENCHES





Fig. 8693C

Fig. 8693D

| Length Open inches | 6 | 8 | 10 | 14 | 18 | 24 | 36 | 48 |
|-----------------------------|-------------------|-----------------|------------------|------------------|------------------|---------------------|-------------|-----------------|
| Takes Pipeinches Priceeach | 1/8to1/2 2.00 | 1/8to34 2.00 | 1/8 to 1 2.25 | 14to11/2 3.00 | 1/4 to 2 4.00 | 1/4 to 21/4 6.00 | 12.00 | 1 to 5 18.00 |
| " Jaws " | . 75 | .75 | .80 | 1.00 | 1.33 | 2.10 | 4.75 | 7.25 |
| " Frames " " Wood Handles " | $\frac{.35}{.16}$ | .35 .16 | .40 | .50 .25 | .55 .28 | .80 | 1.30 | 1.50 |
| " Steel " " " Nuts" | .95 | .95 | 1.10 | 1.45 17 | 2.10 .22 | 3.20 .35 | 6.40 .55 | 9.25 |

BEMIS AND CALL
COMBINATION WITH LONG NUT BRIGGS PATTERN SCREW WRENCH





Fig. 8693E

BRIGGS PATTERN

Fig. 8693F

| Sizeinches | 8 | 10 | 12 | 15 | 18 |
|--|--|----|--|----|----|
| Opensinches Price, Blackper dozen "Bright" | $\begin{array}{c} 134 \\ 10.00 \\ 11.00 \end{array}$ | | $ \begin{array}{r} 214 \\ 14.00 \\ 16.00 \end{array} $ | | |

COMBINATION

| Sizeinches | | | 12 | 15 | |
|---|------------|----------|-------------|-------------|----------|
| Takes Pipe Diameterinches Price, Short Nutper dozen | 1/4 to 3/4 | 1/4 to 1 | 1/2 to 13/4 | 1/2 to 21/4 | 1/2 to 3 |
| Price, Short Nutper dozen | 21.00 | 23.00 | 26.00 | 37.00 | 66.00 |
| " Long " " | 23.00 | 25.25 | 28.50 | 40.50 | 72.00 |

WRENCHES "WESTCOTT" ADJUSTABLE "S" PIPE



NIIT

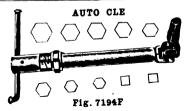


| Fig. 7194A | Fig. 7194B | | | | | | | |
|---|------------|--------------------------------|----------------------------------|---|---|--|--|--|
| Sizeinches | 6 | . 8 | 10 | 12 | 14 | | | |
| Nut Wrench Opens inches Pipe Wrench, Takes Pipe " Price, Nut Wrenches each " Pipe " " | | 1 1/8 to 3/4 .75 1.25 | 13 g 1 g to 1 1.00 1.50 | 1 ⁵ § ½ to 1½ 1.25 2.00 | 2 1 ₈ to 1½ 1.75 2.50 | | | |

No. 1 ALLIGATOR Nos. 2, 3, and 4

Fig. 7194C Fig. 7194D Twin No. 5 Number..... Pocket No. 1 No. 2 No. 3 No. 4 $5\frac{3}{4}$ 22 10 16 27 9 Length.....inches 4 1½ to 2 1½ " 2½ to 3/8 18 to 14 18 14 " % 16 14 3.00 ½ to 1¼ ¾ " 1¾ $^{1}_{8}$ to 38 to 34 to 3 18 to Holds Pipe 11½ " 2 36.00 12.00 " 3½ "1 " Round Iron " 24.00 18.00 4.00 60.00 Price.....per dozen





| "ALWAYS READY" | | | | | | | | | |
|-------------------------------------|------|------------|----------------|---------|--|--|--|--|--|
| Number | 1 | 2 | 21 2 | 3 | | | | | |
| Length inches | 5 | 7 | 91/2 | 111/2 | | | | | |
| read read of Square rion | | 14 to 11/4 | 14 to 134 | 34 to 2 | | | | | |
| Price, Black Polished Jawsper dozen | 4.60 | 6.30 | 10.00 10.50 | 16.00 | | | | | |
| " Nielrol Distad " | 5.00 | 6.75 | 10.00 | 10.00 | | | | | |

| AUTO CLE | | = |
|--|-------|---|
| Price, Small Set, with Wrench with Universal Swivel Attachment, Long and Short Extension Rod, 10 Sockets and Two Screw Drivers, in Leather Case, | 7.50 | |
| Price, Large Set, with Wrench with Universal Swivel Attachment, Long and Short Extension Rod, 30 Sockets 56 to 132 inches, and Two Screw Drivers in Box | 10.00 |) |
| THO DOLLM THE TOTAL TOTAL TOTAL TOTAL THE TOTA | | |

The sockets are square and hexagon and include socket for sparking plug. They will fit any size nut or bolt on any automobile, motor or gas engine of either American or foreign make. Wrench can be worked in any angle up to 90 degrees.

WRENCHES

PARMELEE PIPE WRENCHES



Fig. 5613A

| Number | 1 | 2½ | 31/2 |
|--------------------------------------|-----------------------|--|----------------------|
| Length of Handleinches | _10 | 20 | • 25 |
| Price, Completeeach Takes Pipeinches | 5.00 34, 14, 34, 1 | $\begin{bmatrix} 7.50 \\ 34, 1, 114 \\ 116, 2 \end{bmatrix}$ | 7.50 1¼, 2, 2¼, 3 |
| Price, Clamps Onlyeach | | 1.00 1.25 | 1½, 2, 2½, 3 1.25 |
| " Handles " " | 2.25 | 2.50 | 3.00 |

BRASS PIPE WRENCHES

For Polished or Nickel Plated Brass Pipe

HAYDEN



WARNOCK



Fig. 5613B

Fig. 5613C

HAYDEN

| Number | 2 | 3 |
|--|---|--|
| Length of Wrench Bar inches Takes Pipe " Price of Wrench Bars (only) each " " Clamps " | | 18 11/4, 11/2 and 2 2.50 1.50 |

WARNOCK

| Length inches | 12 | 18 |
|-----------------------------------|----------|-------------|
| Takes Pipeinches | 1/8 to 2 | 1 to 5 |
| Price, Complete each Extra Straps | | 2.50 .50 |

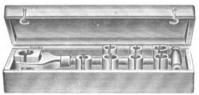


Fig. 5613D

HALLS'

| Number | 1 | 2 |
|-----------------------------------|---------------------|--------|
| Takes Pipe inches Tubing " | 14 to 1 5 4 to 1 | 1 to 2 |
| Priceeach " for I. P. size only " | 7.50 6.80 | 12.00 |
| " Extra Bushings. " | .30 | .55 |



CHAIN PIPE TONGS

"VULCAN BIJAW"

FLAT LINK CHAIN

CABLE CHAIN









CABLE CHAIN

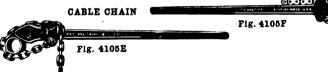
FLAT LINK CHAIN



| FIG. 4100C | F1g. 4100D | | | | | | | |
|---------------------------|------------|----------|----------|--------|--------|--------|--------|-------|
| Number "Bijaw" | 30 | 31 | 32 | 33 | 331/2 | 34 | 35 | · |
| Number, Regular | | | | | | 14 | | |
| Lengthinches | 1334 | 20 | 27 | 37 | 441/2 | 5013 | 6415 | 87 |
| Takes Pipe " | 1/8 to 3 1 | 1 to 1 1 | 1 to 2 1 | 34 to4 | 1 to 6 | 1½ to8 | 2to 12 | 4to18 |
| With Flat Link Chain each | | | | | | | | |
| " Cable Chain " | 2.25 | 3.25 | 4.50 | 6.25 | 7.75 | 9.50 | 16.00 | 40.00 |
| Extra Flat Link Chains " | .75 | 1.00 | 1.50 | 2.50 | 3.25 | 4.00 | 6.00 | 13.00 |
| " Cable Chains " | .50 | .75 | 1.00 | 1.75 | 2.00 | 2.50 | 4.00 | 13.00 |
| | | 1.75 | 2.75 | 4.00 | 4.75 | 5.50 | 7.50 | 16.00 |

TRIMO

FLAT LINK CHAIN



| Number | | | | | | | _16 |
|----------------------------------|--------------|----------|--------|---------|-------------|----------|---------|
| Length inches Takes Pipe | 13^{3}_{4} | 20 | 27 | 37 | 45 | 54 | 65 |
| Takes Pipe " | 11g to 1 | 1 8 to 2 | ½ to 3 | 34 to 6 | 1 to 8 | 1½ to 10 | 2 to 12 |
| Price, with Flat Link Chain each | 2.50 | 3.50 | 5.00 | 7.00 | 9.00 + | 11.00 | 18.00 |
| " " Cable Chain " | | | | | | | 16.00 |
| " Extra Flat Link Chains " | .75 | 1.00 | 1.50 | -2.50 | 3.25 | 4.00 | 6.00 |
| " " Cable Chains " | .50 | .75 | 1.00 | 1.75 | $2.00 \pm$ | 2.50 | 4.00 |
| " Jaws per pair | 1.00 | 1.75 | -2.75 | 4.00 | 4.75^{-1} | 5.50 | 7.50 |

NEW CHAMPION



| Number | U | 1 | 2 | 3 | 4 | 5 |
|------------------|-----------|--------------------------|----------|---------|---------------------|---------|
| Lengthinches | 121/2 | 191/2 | 28 | 3814 | 5012 | 65 |
| Takes Pipe " | 1 6 to 34 | $^{1}_{8}$ to $^{1}_{2}$ | 14 to 2½ | 34 to 6 | $1\frac{1}{2}$ to 8 | 2 to 12 |
| Priceeach | 2.50 | 3.50 | 5.00 | 7.00 | 11.00 | 18.00 |
| " Extra Chains " | . 75 | 1.00 | 1.50 | 2.50 | 4.00 | 6.00 |
| " " Jawsper pair | 1.00 | 1.75 | 2.75 | 4.00 | [-5,50] | 7.50 |

ENGINEERS' WRENCHES SINGLE HEAD, 15° ANGLE



00004

| Fig. 2983A | | | | | | | | | | | | |
|---------------|---|---|-----------------------------|---|-----------------------------|---|---------------------------|--|--|--|--|--|
| Number | For U. S. Standard Nuts Size Bolts Inches | Openings Finished Inches | Extreme Length Inches | Thickness Heads Inches | Price Unfinished Each | Price Semi- Finished Each | Price Finished Each | | | | | |
| 00 | 1/8 3/16 1/4 | 5/6 | · 2½ 2½ 2½ | 5 32 | .08 | .12 | .16 | | | | | |
| 0 | 3/16 | 13 | 27/8 | 3/16 | .09 | .13 | .18 | | | | | |
| 1 | 1/4 | 1/2 | 33/4 | 1/4 | .10 | .15 | .20 | | | | | |
| $\frac{2}{3}$ | 5/16 | 5/66 132 1/24 132 1/65 137 1/65 237 24 11/66 | 43/4 | 572/16/14 925/16/12352/16/24/14/15/15/15/15/15/15/15/15/15/15/15/15/15/ | .12 | .15 .18 .21 .25 .30 .39 .48 .63 .87 | .24 | | | | | |
| 3 | 3/8 | 11/16 | 55% | 5/6 | .14 | .21 | .28 | | | | | |
| 4 | 7/16 1/2 | 25 | 61/2 | 11 | .17 | .25 | .34 | | | | | |
| 5 | 1/2 | 7/8 | 71/3 | 13 | .20 | .30 | .40 | | | | | |
| 6 | 92 | 31 | 83/8 | 7/6 | .26 | .39 | .52 | | | | | |
| 7 | 5/8 | 11/6 | 914 | 1/2 | .26 .32 .42 .58 | .48 | .64 | | | | | |
| 8 | 3/4 | 11/ | 111/8 | 9/2 | .42 | .63 | .84 | | | | | |
| 9 | 7% | 17/16 15/8 113/6 | 13 | 716 21 32 | .58 | .87 | 1.16 | | | | | |
| 10 | 1 0 | 15% | 143/4 | 3/4 | .75 | 1.13 | 1.50 | | | | | |
| 11 | 11/8 | 113% | 161/2 | 27 | 1.00 | 1,50 | 2.00 | | | | | |
| 12 | 114 | 2 | $18\frac{1}{2}$ | 25 | 1,25 | 1.88 | 2.50 | | | | | |
| 13 | 13% | 23/16 | 20 | 132 | 1.62 | 2.43 | 3.24 | | | | | |
| 14 | 11/2 | 23/8 | 22 | 11/16 | 2.00 | 3.00 | 4.00 | | | | | |
| 15 | 15% | 29/16 | 24 | | 2.50 | 3.75 | 5.00 | | | | | |
| 16 | 7.0 | 23/4 | 251/2 | $\begin{array}{c} 1\frac{1}{8} \\ 1\frac{7}{32} \\ 1\frac{7}{32} \end{array}$ | 3.00 | 4.50 | 6.00 | | | | | |
| 161/2 | $\frac{134}{178}$ | 215/16 | 27 | 1 7 | 3.70 | 5.55 | 7.40 | | | | | |
| 17 | 2 | 31/8 | $29\frac{1}{2}$ | 13% | 4.40 | 6.60 | 8.80 | | | | | |
| 18 | 21/ | 31/2 | 33 | $1\frac{3}{8}$ $1\frac{17}{32}$ | 6.00 | 9.00 | 12.00 | | | | | |
| 19 | $\frac{\overline{2}_{14}}{2!_{2}}$ | $\frac{31/2}{37/8}$ | 37 | 15% | 7.60 | 11.40 | 15.20 | | | | | |
| 191/2 | 23/4 | 41/4 | 39 | 15% | 10.00 | 15.00 | 20.00 | | | | | |
| 20 | $\frac{2^{3}}{3}$ | 45/8 | 41 | 17% | 13.00 | 19.50 | 26.00 | | | | | |
| 201/2 | 31/4 | 5 | 43 | 178 | 16.00 | 24.00 | 32.00 | | | | | |
| A21 | 31/2 | 53/8 | 45 | 21/2 | 22.00 | 33.00 | 44.00 | | | | | |
| A2114 | 33/4 | 53/4 | 47 | $\frac{21/2}{21/2}$ | 25.00 | 36.00 | 47.00 | | | | | |
| A211/2 | 4 | 61/8 | 49 | 21/2 | 28.00 | 39.00 | 50.00 | | | | | |
| A22 | 41/2 | 67/8 | 51 | $\frac{21}{2}$ | 40.00 | 60.00 | 80.00 | | | | | |
| A221/2 | 5 | 75/8 | 53 | 3 | 45.00 | 65.00 | 85.00 | | | | | |

Wrenches of this style with taper handles will be turnished on sizes No. 11 and up. The following Semi-finished and Finished Wrenches have hole drilled in end of handle.

| Number | 17 | 18 | 19 | 191/2 | 20 | 201/2 | A21 | A211/4 | A211/2 | A22 | A221/2 |
|---------------------|-----|-----|----|-------|----|-------|------|--------|--------|------|--------|
| Diameter Holeinches | 5/8 | 3/4 | 78 | 7/8 | 1 | 1 | 11/8 | 11/8 | 11/8 | 11/4 | 114 |

UNFINISHED

STYLES OF WRENCHES SEMI-FINISHED



FINISHED

Fig. 2983D

Fig. 2983B Fig. 2983C Unfinished wrenches are milled only. Semi-finished are milled, heads ground bright, and case-hardened all over. Finished are milled, polished all over, case-hardened and lacquered; heads bright.

ENGINEERS' WRENCHES, DOUBLE HEAD



| Number | For U.S. Standard Nuts, Size Bolts, Inches | Openings Milled Inches | Extreme Length Inches | Thickness Heads Inches | Price Unfinished Each | Price Semi- Finished Each | Price Finished Each |
|-----------------|---|--|-----------------------------|--|-----------------------------|---------------------------------|---------------------------|
| | | | | · ———— | | | |
| 21 | 1/8 and 3/6 1/8 " 1/4 | 5/6 and 13/2 | 314 | 32 and 36 | .12 | .18 | .24 |
| 22 | 8 " 14 | 5 " 1/2 13 " 1/2 | 4 | 32 4 14 | .13 | .20 | .26 |
| 23 | 716 71 | 1 13 " 1/2 | 4 | 36 " 14 | .14 | .21 | .28 |
| 24 | l na na | 57 57 | 4 7/8 | 36 " 32 | .16 | .24 | .32 |
| 25 | 14 " 56 | 1/2 " 1/2 | 47/8 | 1/4 " 32 | .18 | .27 | .36 |
| 26 | 14 " 3/8 | 1/2 " 11/6 | $5\frac{7}{8}$ | 14 " 516 | .20 | .30 | .40 |
| 27 | 56 " 38 | 10 " 116 | $5\frac{7}{8}$ | 32 " 56 | .22 | .33 | .44 |
| 28 | 36 " 76 | 13 " 33 | 67/8 | $\frac{3}{32}$ " $\frac{11}{32}$ | .24 | .36 | .48 |
| 29 | 5 4 3/8 56 4 78 56 76 3/8 76 3/8 1/2 7/8 1/2 | 1/20/20/20/20/20/20/20/20/20/20/20/20/20/ | 678 | 52 4 14 4 36 6 4 37 6 4 3 6 6 4 3 6 6 4 3 6 6 6 4 3 6 6 6 6 | .26 | .39 | .52 |
| 30 | 3% " 1% | 116 " 78 | 734 | 516 " 13 | .28 | .42 | .56 |
| 31 | 3/8 " 1/2 7/6 " 1/2 7/6 " 9/6 | 33 " 78 | 737 | 110 " 13 | .30 | .45 | .60 |
| 32 | 72 " 92 | 25 " 31 | 837 | 32 " 76 | .32 | .48 | .64 |
| 33 | 16 " 9/ | 72 " 31 | 837 | 132 " 716 32 " 716 | .36 | .54 | .72 |
| 34 | 12 " 5 | 78 " 1 1 6 | 937 | 32 (16 | .40 | 60 | .80 |
| 35 | 76 " 96 1/2 " 96 1/2 " 5/8 9/6 " 3/4 9/6 " 3/4 1/8 " 7/8 | | 934 | 11 " 716 113 " 716 113 " 16 113 " 12 716 " 12 716 " 916 | .44 | .66 | .88 |
| 36 | 9/4 5/8 9/6 4 3/4 | | 111/5 | 7/ " 9/ | .51 | .77 | 1.02 |
| 30 37 | 5/8 " 3/4 5/8 " 7/8 3/4 " 7/8 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 111/2 | 716 " 916 | .58 | .87 | 1.16 |
| | 5 4 7 | | /2 | 1 2 | | | 1.10 |
| 38 | 8 78 | 1 716 1 716 | $13\frac{1}{2}$ | 2 " 32 | .65 | .98 | |
| 39 | 34 " 1/8 | 1/4 1/16 | $13\frac{1}{2}$ | 16 " 32 | .76 | 1.14 | 1.52 |
| 40 | | 174 178 | $15\frac{1}{2}$ | 96 " 34 | .88 | 1.32 | 1.76 |
| 41 | 1 70 1 | 1.716 1.78 | $15\frac{1}{2}$ | 716 74 21 " 37 32 " 4 | 1.00 | 1.50 | 2.00 |
| 42 | 7/8 " 11/8 | 176 176 | 17 | 32 " 37 | 1.18 | 1.77 | 2.36 |
| 43 | 1 " 11/8 | 158 " 1136 | 17 | 34 " 37 | 1.36 | 2.04 | 2.72 |
| 44 | 1 " 11/4 | 1196 " 2 | 19 | 34 " 38 | 1.55 | 2.33 | 3.10 |
| 45 | 11/8 " 11/4 | 1 ¹³ / ₁₆ " 2 | 19 | 37 " 38 | 1.80 | 2.70 | 3.60 |
| 46 | 11% " 13% | 113/4 4 23/6 | 21 | 33 " 1 | 2.05 | 3.08 | 4.10 |
| 47 | 114 " 13% | 2 " 2% | 21 | 38 " 1 | 2.30 | 3.45 | 4.60 |
| 48 | 11/4 " 11/3 | 2 " 23/8 | 23 | 33 " 116 | 2.65 | 3.98 | 5.30 |
| 49 | 13% " 11/3 | 23/6 " 23/8 | 23 | 1 " 1 16 | 3.00 | 4.50 | 6.00 |
| 50 | 138 " 1½ 138 " 158 | 23/6 " 29/6 | 25 | 1 " 11/8 | 3.35 | 5.03 | 6.70 |
| 51 | 11/2 " 15% | 037 " 997 | 25 | 11/6 " 11/8 | 3.80 | 5.70 | 7.60 |
| 52 | 11/2 " 13/4 | 23/8 " 23/16 | 27 | 116 " 173 | 4.25 | 6.38 | 8.50 |
| 53 | 15% " 134 | 296 " 234 | $\frac{1}{27}$ | $1\frac{1}{18}$ " $1\frac{32}{32}$ | 4.70 | 7.05 | 9.40 |
| 531/3 | 15% " 17% | 296 " 2156 | 29 | $1\frac{1}{1}\frac{1}{8}$ " $1\frac{32}{32}$ | 5.30 | 7.95 | 10.60 |
| 54 | | .00/ (91/ | 31 | 1 7 4 9 7 32. | 5.90 | 8.85 | 11.80 |
| 55 | 158 " 2 134 " 2 | 2716 378 | 32 | - / 0 | 6.50 | 9.75 | 13.00 |
| | 174 4 2 | 2%4 3 %8 | 32 33 | 132 178 | 7.35 | | 14.70 |
| 551/2 | 1170 2 | 4 η ₆ σ γ ₈ | | 132 178 | 8.20 | 11.03 | |
| 56 | 1 1 2 2 1 3 | 274 372 | 34 | 1 32 1 32 | | 12.30 | 16.40 |
| $56\frac{1}{2}$ | 1 1 28 2 23 | -716 3 72 | 35 | 186 155 | 9.05 | 13.58 | 18.10 |
| 57 | 4 44 | 078 072 | 36 | 178 132 | 10.25 | 15.38 | 20.50 |
| $57\frac{1}{2}$ | 2 2/2 | 078 078 | 37 | 1 1 98 1 98 | 11.50 | 17.25 | 23.00 |
| 5 8 | 214 " 21/2 | 072 078 | 38 | 1 | 12.75 | 19.13 | 25.50 |
| 59 | 214 " 234 | 31/2 " 41/4 | 39 | 133 " 15% | 14.50 | 21.75 | 29.00 |
| 60 | 21/2 " 23/4 | $3\frac{7}{8}$ " $4\frac{1}{4}$ | 40 | 158 " 158 | 16.25 | 24 .38 | 32.50 |
| 61 | $2\frac{1}{2}$ " 3 | $3\frac{7}{8}$ " $4\frac{5}{8}$ | 42 | 15% " 17% | 18.00 | 27.00 | 36.00 |
| 62 | $23\frac{7}{4}$ " 3 | 414 " 458 | 44 | 158 " 178 | 20.50 | 30.75 | 41.00 |
| | | - | | √ (| | | |

Made regularly with openings for U. S. Standard finished nuts; A. L. A. M. Standard, Whitworth, Standard and Metric Measure milled to order.

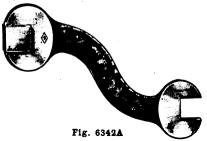
"S" WRENCHES WITH CONCAVE HANDLE 221/2° ANGLE, DOUBLE HEAD. FOR NUTS AND HEXAGON HEAD CAP SCREWS



| Number | dardNuts; Size | For Hex. Head Cap-Screws; D'm. Scr'ws In. | Openings Milled Inches | Extreme Length Inches | Thickness Heads Inches | Price, Un- finished Each | Price, Semi-fin- ished Each | Price, Finishe Each |
|--------|--------------------------|---|---|-----------------------------|------------------------------|--------------------------------|-----------------------------------|---------------------------|
| 235E | 1 and 3/6 | | 5/6 and 13/32 | 35/8 | 1/4 and 9 | .13 | .20 | .26 |
| 240B | 1/8 and 3/6 1/8 " 1/4 | | 5/6 " 1/2 | 47/8 | 32 " 5/6 | .18 | .27 | .36 |
| D | | 3/6 and 1/4 | 5/6 and 13/2 5/16 " 1/2 3/8 " 7/16 | -70 | 32 710 | .18 | .27 | .36 |
| E | 3/16 and 1/4 | 710 74 | $\frac{13}{32}$ " $\frac{1}{2}$ | | | .18 | .27 | .36 |
| F | 3/16 " 5/16 | | $\frac{13}{32}$ " $\frac{1}{2}$ $\frac{13}{32}$ " $\frac{19}{32}$ | | | .18 | .27 | .36 |
| G | 14 " 5/16 | | 1/2 " 19 | | | .18 | .27 | .36 |
| 246E | /4 /10 | 3/6 and 5/6 | 3/8 " 1/2 | 534 | 5/6 and 11 | .21 | .32 | .42 |
| F | | 3/ 11 3/ | 3/4 16 9/ | | | .21 | 32 | .42 |
| G | | 1/ 11 5/ | 7/6 " 1/2 7/6 " 9/6 | | | .21 | .32 | .42 |
| H | | 14 " 3/8 | 7/6 " 9/6 | | | .21 | .32 | .42 |
| I | 14 and 3/8 | 74 76 | 1/2 " 11/6 | | | .21 | .32 | .42 |
| 251C | 74 78 | 5/6 and 3/8 | | 61/2 | 3/8 and 13 | .25 | .38 | .50 |
| D | | 5/e " 7/e | 1/2 " 5/8 1/2 " 5/8 | | 76 32 | .25 | .38 | .50 |
| E | 5/6 and 3/8 | | 19 " IL | 61/2 | 3/8 and 13 | .25 | .38 | .50 |
| F | 5/6 " 7/6 | | 19 44 25 32 44 32 | -/2 | 78 | .25 | .38 | .50 |
| 255C | /16 /16 | 5 and 1/2 | 1/2 " 3/4 | 71/4 | 13 and 76 | .30 | .45 | .60 |
| E | | 3/8 " 7/16 | 97 66 5/ | 1/4 | 32 000 /16 | .30 | .45 | .60 |
| H | | 3/8 " 7/6 3/8 " 1/2 | 9/16 · 3/4 | | | .30 | .45 | .60 |
| J | 3/8 and 7/6 | /8 /2 | 11/ 66 25 | | | .30 | .45 | .60 |
| K | 3/8 " 1/2 | | 11 / 14 7/ | | | .30 | .45 | .60 |
| 26313 | 78 72 | 7/6 and 1/2 | 5/ 44 3/ | 8 | 1/2 and 1/3 | .38 | .57 | .76 |
| C | | 7/6 " 9/6 | 18 /4 | O | /2 and 32 | .38 | .57 | .76 |
| Ğ | | 1/2 " 9/6 | | | | .38 | .57 | .76 |
| I | | 1/2 " 5/8 | 34 " 13 16 34 " 78 | | | .38 | .57 | .76 |
| J | 7/6 and 1/2 | 72 78 | 25 " 7/8 | | | .38 | .57 | .76 |
| K | 7/ 66 9/ | | 32 25 32 46 31 32 | | | .38 | .57 | .76 |
| L | 16 16 9 | | $\frac{32}{78}$ " $\frac{32}{31}$ | | | .38 | .57 | .76 |
| M | 12 11 5 | | 78 " 1 16 | | | .38 | .57 | .76 |
| 274B | 72 78 | 1/2 and 3/4 | | 10 | 17 and % | .50 | .75 | 1.00 |
| C C | | 1/2 and 3/4 9/6 " 5/8 | | 10 | 32 4110 16 | .50 | .75 | 1.00 |
| Ď | | 96 4 34 | | | | .50 | .75 | 1.00 |
| E | | | ¹³ ₁₆ " 1 ⁷ ₈ " 1 | | | .50 | .75 | 1.00 |
| G | 9% and 5% | 5/8 " 3/4 | 31 " 11 | | | .50 | .75 | 1.00 |
| H | 9/6 and 5/8 | | 32 1/16 | | | .50 | .75 | 1.00 |
| I | | | 99 1 14 | | | .50 | .75 | 1.00 |
| | 5/8 " 3/4 | 5 and 7 | 716 114 | 1117 | 5/ and 11/ | .75 | 1.13 | 1.50 |
| 281F | | g and | | $11\frac{1}{2}$ | 5/8 and 11/16 | | 1.13 | 1.50 |
| G | | 34 1 8 | 1 1/8 | **** | | .75 | 1.13 | 1.50 |
| H | | 4 | 1 1/4 | **** | ****** | .75 | 1.13 | 1.50 |
| I | 5/ | 78 " 1 | | | | .75 .75 | 1.13 | 1.50 |
| J | 5/8 and 7/8 | | 1 16 1 16 | | | | 1.13 | 1.50 |
| K | 34 " 1/8 | 7/ 1110 | 1 1 1 16 | 1417 | 2/0017/ | .75 | | 2,00 |
| 288F | | 7 s and 11 8 | 118 " 19/8 | $14\frac{1}{2}$ | 34 and 7/8 | 1.15 | 1.73 | 2,30 |
| K | 34 and 1 7% " 1 | | 174 1 8 | | | 1.15 | 1.73 | 2.30 |
| L | 7/8 " 1 | | $1\frac{7}{6}$ " $1\frac{5}{8}$ | | | 1.15 | 1.73 | 2.30 |

FLAT HANDLE "S" WRENCHES

22½° ANGLE, DOUBLE HEAD FOR SQUARE HEAD CAP AND SET SCREWS



Made regularly for set screws and square head cap screws: Whitworth Standard and Metric Measure to order.

| | Size Square Head | Openings | Size | Length | Thickness | F | RICE, EAG | н |
|--------------|-------------------------|---|----------------------------------|--------------------|----------------------------------|------------------|-------------------|------------|
| Number | Cap Screws Inches | Cap Screws Milled Set Screws | | Over All Inches | Heads Inches | Un- tinished | Semi- Finished | Finished |
| 661 H | | •••• | 14 X 516 | 4 | 9 | .13 | .20 | .26 |
| J | | | 14 x 3 8 | 4 | 9 32 32 32 55 516 | .13 | .20 | .26 |
| K | | | 5 X 3 8 | 4 | 32 | .13 | .20 | .26 |
| \mathbf{L} | | | 516 X 716 | 4 | 32 | .13 | .20 | .26 |
| 662 H | 14 x 5/6 | 3 x 7 ₁₆ | 3 8 x 7/16 | 5 | 5/6 | .17 | .26 | .34 |
| J | 14 x 3 8 | $\frac{3}{8}$ x $\frac{1}{2}$ | $\frac{3}{8} \times \frac{1}{2}$ | 5 | 516 | .17 | .26 | .34 |
| K | 56 X 38 | $\frac{7}{16} \times \frac{1}{2}$ | 76 X 12 | 5 | 5/6 | .17 | .26 | .34 |
| L | 516 X 716 | 7/6 x %6 | 76 X 96 | 5 | 5 16 | .17 | .26 | .34 |
| 663 H | 3/8 x 7/6 | 1/2 X % | 1/2 X 9/6 1/2 X 5/8 | 614 | 3 8 3 8 | .22 | .33 | .44 |
| ij | 3 x 1/2 7/6 x 1/2 | $\frac{1}{2}$ x $\frac{5}{8}$ | 1/2 x 5 8 | 614 | 38 | .22 | .33 | .44 |
| K | 16 X 1/2 | 9 ₁₆ x 5 8 | % x 5 8 | 614 | 3 3 | .22 | .33 | .44 |
| M CC4 H | % x % | 916 X 11 16 | 9/ 2/ | 014 | 3 8 | $.22 \\ .28$ | .33 .42 | .44 |
| 664 H J | 1/-5/ | 5/-3/ | 916 X 34 | 71/2 | 716 716 716 | .28 | .42 | .56 .56 |
| ĸ | 1/2 x 5/8 | $\frac{5}{6} \times \frac{34}{4}$ | 5 x 3 4 5 x 7 x | 71/2 | 216 7 | .28 | .42 | .56 |
| M | 1/-9/ | 5 8 X 11/6 | 5 8 x 7 8 | $7\frac{7}{2}$ | 716 716 | .28 | .42 | .56 |
| Ö | 1/2 X 9/16 9/6 X 5/8 | $\frac{5}{10} \frac{8}{10} \times \frac{11}{16} \times \frac{3}{4}$ | •••• | $7\frac{7}{2}$ | /16 7/ | .28 | .42 | .56 |
| Ř | 916 X 3/4 | 11 ₁₆ x 7 x | | $7\frac{7}{2}$ | 716 716 | $.\overline{28}$ | .42 | .56 |
| 665 H | 56 X 34 | 34 x 78 | 3 í x 7 s | 92 | 16 | .36 | $.5\overline{4}$ | .72 |
| J | /8 4.71 | 74 4 8 | 3 x 1 | ğ | 1,3 | .36 | .54 | .72 |
| ĸ | | •••• | 7 x 1 | ğ | 1,5 | .36 | $.5\overline{4}$ | .72 |
| 666 H | 34 x 7/8 | 78 x 118 | 75 x 115 | 101/2 | 1/2 1/2 1/2 1/2 9/6 | .48 | .72 | .96 |
| J | 1 74 78 | , , | 1 x 11. | 10^{12} | 977 | .48 | .72 | .96 |
| K | | | $1 \times 1)_{4}^{2}$ | $10^{1/2}$ | 9,6 | .48 | .72 | .96 |
| M | 5 4 X 7 4 | 34 x 11 8 | | 101/2 | 916 | . 48 | .72 | .96 |
| () | 34 x 1 | $7 \times \times 11_4$ | | 10! 5 | 970 | .48 | 72 | .96 |
| 667 H | 73 x 1 | 11 6 x 11 1 | 118 x 114 | 12 | 5.8 | .72 | 1.08 | 1.44 |
| M | 78 x 118 | $11_{8} \times 13_{8}$ | | 12 | 1 55 | .72 | 1.08 | 1.44 |
| O | 1 x 1 1/8 | 114 x 13 4 | | 12 | 5 8 | .72 | 1.08 | 1.44 |
| 668 M | 1 x 1!4 | $1\frac{1}{4} \times 1\frac{1}{2}$ | | 14 | 34 | 1.10 | 1.65 | 2.20 |
| O | 11/4 x 11/4 1 | $1^3 \le x \ 1^{1/2}$ | · | 14 | 34 | 1.10 | 1.65 | 2.20 |

When ordering please use numbers and state whether unfinished, semi-finished or finished wrenches are desired. Unless otherwise specified, finished wrenches will be supplied. Special milling to order without extra charge in lots of 50 or more of a size.

A sample nut or screw, as gauge, should accompany order.

Special wrenches made to order. Price will be quoted upon receipt of models or drawings and specifications stating kind of finish and quantity required.

FLAT HANDLE "S" WRENCHES 22% ANGLE, DOUBLE HEAD



| F1 | g. | 63 | 43 | A |
|----|----|----|----|---|
| | | | | |

| i | Size | Size | Openings | Length | Thick- | | PRICE, KA | CH |
|----------------------|--|---|--|---------------------------------|--|---|-------------------|--------------|
| Number | U. S. Bolts Inches | Hex. Head Cap Screws Inches | Milled Inches | Over All Inches | ness Heads Inches | Un- finished | Semi- Finished | Finished |
| 661 A | 1/8 X 3/6 1/8 X 1/4 3/6 X 1/4 | | 5 ₁₆ x 13 5 ₁₆ x 1⁄2 13 x 1⁄2 | 4 | 32 | .13 | .20 | .26 |
| В | 1/8 X 1/4 | | 56 x 1/2 | 4 | 2020 22 02 02 02 02 02 02 02 02 02 02 02 | .13 | .20 | .26 |
| $\ddot{\mathbf{C}}$ | 3/4 X 1/1 | 1 | 13 x 15 | 4 | 22 | 13 | .20 | .26 |
| Ď | /10 /4 | 1/8 X 3/16 3/16 X 1/4 3/16 X 5/16 | 56 X 3 4 | 4 | 27 | .13 | .20 | .26 |
| F | | 3 x 1 | 3 8 x 7/16 | 4 | 35 | .13 • | .20 | .26 |
| Ğ | | 8% x 5% | 5 16 X 3 X 16 3 8 X 1/2 13 X 32 19 10 10 10 10 10 10 10 10 10 10 10 10 10 | 4 | 35 | . 13 | .20 | .26 |
| 662 A | 3/6 X 5/6 | /10 /10 | 13 x 12 | 5 | 3,2 | . 17 | .26 | .34 |
| B | 3/16 X 5/16 1/4 X 5/16 | | 13 x 12 12 x 12 | 5 | 516 516 516 516 | .17 | .26 | .34 |
| $\ddot{\mathbf{c}}$ | 1/4 x 5/6 1/4 x 3/8 | | 12 x 11/6 | 5 | 54 | .17 | .26 | .34 |
| $\tilde{\mathbf{p}}$ | 74 4 78 | 1/ x 5/ | 7/6 x 1/2 | 5 5 | 516 | .17 | .26 | .34 |
| Ĕ | •••• | 14 x 516 14 x 3 8 516 x 3 8 516 x 716 | 76 X 96 | 5 | 5 16 | .17 | .26 | .34 |
| F | •••• | 5/ v 3/ | 16 x 16 | 5 | 516 | .17 | 26 | .34 |
| G | •••• | 716 A 78 | $\frac{72 \times 16}{12 \times 58}$ | 5 | 5/ 5/ | .17 | 26 | .34 |
| 663 A | 5/ 3/ | 716 X 716 | /4 /3 | 617 | 3/6 | .22 | .33 | .44 |
| 005 A В | 5 ₁₆ x 3/8 5 ₁₆ x 7 ₁₆ | | 19 X 11/6 19 X 25 | 614 614 | 38 | .22 | .33 | .44 |
| Č | 5/6 x 7/6 3/8 x 7/6 | •••• | 32 X 32 | 614 | 5\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | . 22 | .33 | .44 |
| Ď | % X 16 | 3/ 7/ | H16 x 355 916 x 5 8 916 x 3 34 5 8 x 3 4 5 8 x x 7 7 8 | 614 | 38 | .22 .22 .22 | .33 | .44 |
| E | •••• | 3/8 x 7/6 3/8 x 1/2 7/6 x 1/2 7/6 x 9/6 | 9/6 X 5/8 | 6.4 | 38 | 99 | .33 | . 44 |
| E F | • • • • | 38 X 1/2 | 5 x 3 | 014 | 38 | .22 | .33 | .44 |
| | • • • • | 16 X 1/2 | 98 X 94 | 614 | 38 | $\begin{array}{c} .22 \\ .22 \end{array}$ | .33 | .44 |
| G | | 16 X 16 | 5 8 X 13 6 | 614 | 28 | .22 | .33 | |
| 664 A | $\frac{3}{8} \times \frac{1}{2}$ | •••• | 116 x 78 | $71\frac{7}{2}$ $71\frac{7}{2}$ | 16 | .28 | .42 | .56 |
| В | 3/8 X 1/2 7/16 X 1/2 7/16 X 9/16 | • • • • • | 35 x 78 | 71/2 | 716 716 716 716 716 716 | .28 | .42 | .56 |
| Ç | 16 X 16 | 1 , | 32 x 31 34 x ¹³ 16 | $71\frac{7}{2}$ | _16 | .28 | .42 | .56 |
| D | • • • • | 1/2 x 9/16 1/2 x 5/8 9/6 x 5/8 | 32 x 31 34 x 136 34 x 7 8 | $7\frac{7}{2}$ | _16 | .28 | .42 | . 56 |
| E | • • • • | 12 X 5 8 | 34 x 78 | 71/2 | 16 | .28 | .42 | .56 |
| F | | 916 X 58 | 13 x 7/8 | $7\frac{7}{2}$ | 16 | .28 | .42 | .56 |
| 665 A | ½ x %6 | | 78 x 31 | 9 | 1/2 | .36 .36 | .54 | . 72 |
| В | $\frac{1}{2} \times \frac{5}{8}$ | | 7% x 1 1/6 | 9 | 1/2 | .36 | .54 | . 72 |
| C | 1/2 x 9/16 1/2 x 5/8 9/16 x 5/8 | | 312 x 1 16 136 x 1 | 9 | 1/2 | .36 .36 | .54 | . 72 . 72 |
| D | • • • • | % x 34 | 13% x 1 | 9 | 1/2 | .36 | .54 | . 72 |
| E | | 9/6 X 3/4 5/8 X 3/4 5/8 X 7/8 3/4 X 7/8 | 7 × 1 7/8 × 1 | 9 | 1/2 | .36 | .54 | .72 |
| F | | 5 8 x 7 8 | 7/8 x 11/8 | 9 | 1/2 | .36 .36 | .54 | .72 |
| G | | 34 x 78 | I I XII | 9 | 1/2 | .36 | .54 | .72 |
| 666 A | 9/6 x 3/4 5/8 x 3/4 5/8 x 7/8 | '' | 31 x 114 116 x 114 | $10\frac{1}{2}$ | 7,7,7,7,7,7,7,7,8,8,8,8,8,8,8,8,8,8,8,8 | .48 | .72 | .96 |
| В | 5 x 3/4 | | $1\frac{7}{6} \times 1\frac{7}{4}$ | $10\frac{1}{2}$ | 9/ | .48 | .72 | .96 |
| \mathbf{C} | 53×73 | 1 | 116 x 176 | 10^{12} | 9% | .48 | .72 | .96 |
| Ď | / 0 9 | 34 x 1 | 1×1^{1} | 1013 | 9, | . 48 | .72 | .96 |
| E | | $\begin{array}{c} 34 \times 1 \\ 78 \times 1 \end{array}$ | 11 6 x 11 4 11 6 x 13 8 11 4 x 176 | 101/2 | 919 916 | .48 | .72 | .96 |
| F | | 38 x 116 | 112 x 133 | 101 2 | 910 | .48 | .72 | .96 |
| 667 A | 34 x 78 | 3/3 | 114 x 176 | 12 | 58 | .72 | 1.08 | 1.44 |
| B | $3\frac{4}{4}\times1$ | | $\begin{array}{c} 11_{4}^{1} \times 15_{3}^{16} \\ 17_{16}^{2} \times 15_{8}^{16} \end{array}$ | 12 | 5/8 5/8 | $.7\overline{2}$ | 1.08 | 1.44 |
| č | 74 x 1 | | 176 x 15 | 12 | ∠ ⊙ | $.7\overline{2}$ | 1.08 | 1.44 |

GENERAL SERVICE WRENCHES

FOR CARRIAGE WORKERS, AUTOMOBILISTS, ETC. IN ROLL IN BOX IN ROLL









Fig. 6356A

Fig. 6356C

Pig. 6356B

| CAR | RIA | GF | WO | RK | FRS |
|-----|-----|----|----|----|-----|
| | | | | | |

| | | JE | | | | = |
|---|------------|-----------|---------|------------|------------|---|
| Number (Set No. 1) | 475 | 477 | 479 | 481 | 483 | |
| Standard Nuts Size of Boltsinches Openings Milled" | 316 and 14 | 1 and 5/6 | 5 and 3 | 3 6 and 7/ | 7/and | 1 |
| Openings Milled " | 13 " 1/3 | 1/2 " 53 | 5% " in | 112 " 27 | 26 6 1 | 5 |
| Length Over All " | 614 | 71% | 814 18 | 16 Q1 / 32 | 1 32 103 £ | |
| Price, Unfinished each | .13 | 17 | .22 | .28 | .34 | |
| " Semi-Finished " | .20 | .25 | 33 | .42 | .51 | |
| " Finished " | .26 | .34 | .44 | .56 | .68 | |
| | | | | | 06 | |

AUTOMOBILE

| | CIVIOD | | | | |
|--|----------|-------------|-------------|------------|--------|
| Number (Set No. 2) | 475A | 479A | 481A | 483A | 485 B |
| For A.L.A.M. Standard, Size of Bolts, inches | 1 and 56 | 3/8 and 7/6 | 1/2 and 9/6 | 5 and 11/2 | 3/80 |
| Openings Milled " | 3 " 13 | 96 " 115 | 37 " 7% | 136 " 1" | 11/4 7 |
| Length Over All " | 617 | 814 710 | 917 | 103/5 | 78, 11 |
| Price, Unfinishedeach | .13 | 22 | .28 | .34 | 13 -4 |
| " Semi-Finished " | .20 | .33 | .42 | .51 | .44 |
| " Finished " | .26 | .44 | .56 | .68 | .66 |
| | | | | | |

GENERAL SERVICE

| Number (Set No. 3) | 475B | 477B | 479B | 481B | 483B | 40: |
|------------------------------|--------------|-------------|---------------|---------------|-----------|-----------------|
| Openings Milledinches | 3 s and 7/16 | 1/2 and 9/6 | 5/8 and 11/16 | 3/4 and 13/16 | 1/8 and 1 | 11/8 and 1 |
| Length Over All " | 614 | 71/8 | 81/4 | 914 | 103/8 | S and |
| Price Unfinished " | .13 | .17 | .22 | .28 | .34 | 15 17 |
| " Semi-Finished. " Finished" | .20 | .25 | .33 .44 | .42 | .51 | .44 |
| Timbled | . 20 | .34 | .44 | | .00 | $ \cdot e^{g} $ |

COMPLETE SETS OF WRENCHES

| Description | Unfinished Semifinished |
|---|----------------------------------|
| Price Carriage Makers Wrenches (Set No. 1)per set (5) "Automobile Wrenches (Set No. 2) | 1.13 1.71 Pinist |
| "Automobile Wrenches (Set No. 2) | hoxes without 62.82 3.16 charge. |



SINGLE HEAD SOCKET WRENCHES



Fig. 2676A

WITH OR WITHOUT HANDLE. FOR SQUARE NUTS, CAP-SCREWS AND SET-SCREW

Unfinished are broached only.

Semi-finished are broached, edges ground and case-hardened all over.

Finished are broached, polished all over, case-hardened and lacquered.

Hexagon end of shank is designed for use in combination with another wrench or with Pin-Handle.

Unless otherwise specified, wrenches with Pin-Handles will be sent.



Fig. 2676B

| | | | nare nings | | | | | as U. | Size o | of Pin- ndle | Unfir | ice, nished ach | Price, fini Es | Semi- shed ach | E | rice, ished ach |
|-----------------------|--|--|-----------------------------------|---|--|--|--------------------------------------|---|--|---|--|---|--|---|--|---------------------------------|
| New Number | For U. S. Stand- ard Nut; Size, Inches | For Cap-Screw; Diam. Screw, Inches | For Set-Screw, Size, Inches | Short Diam. Broached Opening. Inches | Extreme Length Inches | Diam. of Head Inches | Diam, of Shank Inches | Hex. End same size as U. S. Nut; for Size Bolt Inches | Diameter Inches | Length Inches | Without Pin- Handle or Hole for same | With Pin-Handle and Hole for same | Without Pin- Handle or Hole for same | With Pin-Handle and Hole for same | Without Pin- Handle or Hole for same | With Pin Handle and Hole for |
| 960H | | | 1/8 | 1/8 | 35/8 | 11 32 | $\frac{7}{32}$ | 1/8 | 1/8 | 3 | .18 | .26 | .27 | .35 | .36 | .44 |
| 961H 961J 962H | | | 3/16 1/4 5/16 | $\begin{array}{r} 13 \\ 64 \\ 17 \\ 64 \\ 21 \\ 64 \end{array}$ | $\frac{4}{4}$ $\frac{4}{4}$ $\frac{1}{2}$ | 1/2 1/2 5/8 | 1/4 1/4 3/8 | 3/6 3/6 1/4 | 3/16 3/16 7/3/2 | $\frac{4}{4}$ $4\frac{1}{2}$ | .20 .20 .22 | .30 .30 .33 | .30 .30 .33 | .40 .40 .41 | .40 .40 .44 | .50 .50 .55 |
| 963H 965H 966H | 14 | 1/4 5/16 3/8 | 3/8 7/ 16 1/2 | 25 64 29 64 33 64 | $\frac{47/8}{53/4}$ $\frac{61/8}{8}$ | 11/16 7/8 1 | 3/8 7/16 1/2 | 5/16 3/8 7/16 | 9 32 5 16 11 32 | 51/8 53/4 61/8 | .24 .29 .32 | .37 .43 .47 | .36 .44 .48 | .49 .58 .63 | .48 .58 .64 | .61 .72 .79 |
| 967H 967X 968H | 5/16 | 7/6 1/2 | 9/18 5/8 | 37 64 39 64 41 | $\frac{6\frac{1}{2}}{6\frac{1}{2}}$ | 1½ 1½ 1½ 1¼ | 9/16 9/16 5/8 | 1/2 1/2 1/2 1/2 | 13 32 13 32 13 32 13 32 | $6\frac{3}{4}$ $6\frac{3}{4}$ $6\frac{3}{4}$ | .36 .36 .40 | .53 .53 .57 | .54 .54 .60 | .71 .71 .77 | .72 .72 .80 | .89 .89 .97 |
| 968M 969H 970 X | 3/8 -7/16 | 9/16 5/8 | 3/4 | $\frac{45}{64}$ $\frac{49}{64}$ $\frac{51}{64}$ | 7 73/8 71/8 | $\frac{11/4}{13/8}$ $\frac{11/2}{11/2}$ | 5/8 5/8 11/6 | 1/2 9/16 5/8 | 13 32 7 16 1/2 | 63/4 73/8 81/8 | .40 .46 .52 | .57 .64 .72 | .60 .69 .78 | .77 .87 .98 | .80 .92 1.04 | .97 1.10 1.24 |
| 971H 972X 973H | 1/2 9/16 | 3/4 | 7/8 1 | $1\frac{57}{64}$ $1\frac{1}{64}$ | 81/4 85/8 91/8 | $\frac{15}{8}$ $\frac{13}{4}$ $\frac{17}{8}$ | 3/4 13/6 7/8 | 5/8 3/4 3/4 | 1/2 9/6 5/8 | 81/8 85/8 91/8 | .60 .70 .80 | .80 .95 1.10 | .90 1.05 1.20 | 1.10 1.30 1.50 | 1.20 1.40 1.60 | 1.40 1.65 1.90 |
| 974X 974H 976H | 5/8 3/4 | ;; 1 | 1½ 1½ 1¼ | $1\frac{5}{64}$ $1\frac{5}{32}$ $1\frac{9}{32}$ | 9½ 9½ 103/8 | 2 2 21/4 | 15/ 16 15/ 16 1 1/6 | 7/8 7/8 1 | 11/ 16 11/ 16 3/4 | 9½ 9½ 103/8 | .90 .90 1.15 | 1.25 1.25 1.55 | 1.35 1.35 1.72 | 1.70 1.70 2.12 | 1.80 1.80 2.30 | 2.15 2.15 2.70 |
| 977M 977X 977O | 7/8 | 1 1/8 11/4 | | $\begin{array}{c} 1\frac{13}{32} \\ 1\frac{15}{32} \\ 1\frac{17}{32} \end{array}$ | 1078 1078 1078 | 21/2 | 11/8 11/8 11/8 | $\frac{1\frac{1}{8}}{1\frac{1}{8}}$ | 13/ 16 13/ 16 13/ 16 | $10\frac{7}{8}$ $10\frac{7}{8}$ $10\frac{7}{8}$ | 1.30 1.30 1.30 | 1.75 1.75 1.75 | 1.95 1.95 1.95 | 2.40 2.40 2.40 | 2.60 2.60 2.60 | 3.05 3.05 3.05 |
| 978M 979X 980X | 1 1½ 1½ 1¼ | 13/8 | | $\begin{array}{c} 1\frac{21}{32} \\ 1\frac{27}{32} \\ 2\frac{1}{32} \end{array}$ | $\frac{11\frac{3}{8}}{11\frac{7}{8}}$ $\frac{12\frac{1}{2}}{2}$ | $\frac{2^{3}4}{3}$ | 1^{3}_{16} 1^{1}_{4} 1^{3}_{8} | 1½ 1¼ 1¾ 13% | 13/6 7/8 | $10\frac{7}{8}$ $11\frac{7}{8}$ $12\frac{1}{2}$ | 1.60 2.10 2.80 | 2.05 2.60 3.45 | 2.40 3.15 4.20 | 2.85 3.65 4.85 | 3.20 4.20 5.60 | 3.65 4.70 6.25 |

SINGLE HEAD SOCKET WRENCHES



Unfinished are broached only.

Semi-finished are broached, edges ground and case-hardened all over.

WITH OR WITHOUT HANDLE, FOR HEXAGON NUTS AND CAP-SCREWS

Finished are broached, polished all over, case-hardened and lacquered.

Hexagon end of shank is designed for use in combination with another wrench or with Pin-Handle.

Unless otherwise specified, wrenches with Pin-Handle will be sent.

Square openings can also be furnished upon application.

Fig. 2677A

| | | lexago penin | | | | k | se as Size | Size (| of Pin- ndle | Unfit Ea | rice nished ach | Semi- | finish- Each | Fin | rice ished ach |
|--------------------------------------|--|---|--|--|--|---|--|--|---|--|--|--|--|--|--|
| New Number | For U. S. Stan- dard Nut; Size Bolt, Inches | For Cap-Screw; Diam. Screw Inches | Short Diam. Broached Opening, Inches | Extreme Length Inches | Diameter of Head Inches | Diameter of Shank Inches | Hex. End same size U. S. Nut; for Si. Bolt, Inches | Diameter Inches | Length Inches | Without Pin- Handle or Hole for same | With Pin- Handle and Hole for same | Without Pin- Handle or Hole for same | With Pin- Handle and Hole for same | Without Pin- Handle or Hole for same | With Pin- Handle and Hole for same |
| 961A | 1/8 | | $\frac{21}{64}$ | 4 | 1/2 | 1/4 | 3/16 | 3/16 | 4 | .20 | .30 | .30 | .40 | .40 | .50 |
| 962D 963A 963D | 3/16 | 3/6 1/4 | 25 64 27 64 29 64 | $4\frac{1}{2}$ $4\frac{7}{8}$ $4\frac{7}{8}$ | 5/8 11/16 11/16 | 3/8 3/8 3/8 | 1/4 5/16 5/16 | $ \begin{array}{r} 7 \\ 32 \\ 9 \\ 32 \\ \hline 9 \\ \hline 32 \\ \hline 9 \\ 7 \\ 9 \\ 7 \\ 9 \\ $ | 4½ 5½ 5½ 5½ | .22 .24 .24 | .33 .37 .37 | .33 .36 .36 | .44 .49 .49 | .44 .48 .48 | .55 .61 .61 |
| 964A 965D 965A | 1/4 5/16 | 5/16 3/8 | 33 64 37 64 39 64 | $5\frac{1}{4}$ $5\frac{3}{4}$ $5\frac{3}{4}$ | 3/4 7/8 7/8 | 3/8 7/16 7/16 | 5/6 3/8 3/8 | 9 32 5 16 5 16 | 51/8 53/4 53/4 | .26 .29 .29 | .39 .43 .43 | .39 .44 .44 | .52 .58 .58 | .52 .58 .58 | .65 .72 .72 |
| 966D 967A 967D | 3/8 | 7/6 1/2 | 41 64 45 64 49 64 | $6\frac{1}{8}$ $6\frac{1}{2}$ $6\frac{1}{2}$ | $\frac{1}{1\frac{1}{8}}$ $\frac{11}{8}$ | 1/2 9/16 9/16 | 7/16 1/2 1/2 1/2 | 11 32 13 32 13 32 13 32 | 6½ 6¾ 6¾ 6¾ | .32 .36 .36 | .47 .53 .53 | .48 .54 .54 | .63 .71 .71 | .64 .72 .72 | .79 .89 .89 |
| 968A 968D 969A | 7/6 1/2 | 9/16 5/8 | 51 64 53 64 57 64 | 7 7 7 ³ / ₈ | $\frac{1\frac{1}{4}}{1\frac{1}{4}}$ $\frac{13}{8}$ | 5/8 5/8 5/8 | 1/2 1/2 1/2 9/16 | 13 32 13 32 7 16 | $6\frac{3}{4}$ $6\frac{3}{4}$ $7\frac{3}{8}$ | .40 .40 .46 | .57 .57 .61 | .60 .60 | .77 .77 .87 | .80 .80 .92 | .97 .97 1.10 |
| 970A 970D 971A 972D | %6 5/8 | 3/4 7/8 | $1\frac{\frac{63}{64}}{1\frac{5}{64}}$ $1\frac{5}{64}$ $1\frac{5}{32}$ | 77/8 77/8 81/4 85/8 | $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{5}{8}$ $1\frac{3}{4}$ | 11/16 11/16 3/4 13/16 | 5/8 5/8 5/8 3/4 | 1/2 1/2 1/2 1/2 9/16 | 81/8 81/8 81/8 81/8 85/8 | .52 .52 .60 .70 | .72 .72 .80 .95 | .78 .78 .90 1.05 | .98 .98 1.10 1.30 | 1.04 1.04 1.20 1.40 | 1.24 1.24 1.40 1.65 |
| 973A 974D 975A 975D | 3/4 :7/8 | 1 1½ 1¼ 1¼ | $\begin{array}{c} 1\frac{9}{32} \\ 1\frac{13}{32} \\ 1\frac{15}{32} \\ 1\frac{17}{32} \end{array}$ | 9½ 9½ 10 10 | $\frac{17/8}{2}$ $\frac{21/8}{21/8}$ | 7/8 15/16 1 | 3/4 7/8 7/8 7/8 | 5/8 11/16 11/16 11/16 | 91/8 91/2 91/2 91/2 91/2 | .80 .90 1.00 1.00 | 1.10 1.25 1.35 1.35 | 1.20 1.35 1.50 1.50 | 1.50 1.70 1.85 1.85 | 1.60 1.80 2.00 2.00 | 1.90 2.15 2.35 2.35 |
| 976A 977A 978A 979A 980A | $\begin{array}{c c} 1 \\ 1\frac{1}{8} \\ 1\frac{1}{4} \\ 1\frac{3}{8} \\ 1\frac{1}{2} \end{array}$ | | $\begin{array}{c} 1\frac{21}{32} \\ 1\frac{27}{32} \\ 2\frac{1}{32} \\ 2\frac{7}{32} \\ 2\frac{7}{32} \\ 2\frac{13}{32} \end{array}$ | $\begin{array}{c} 103/8 \\ 107/8 \\ 113/8 \\ 117/8 \\ 121/2 \end{array}$ | $2\frac{1}{4}$ $2\frac{1}{2}$ $2\frac{3}{4}$ 3 $3\frac{5}{16}$ | $\frac{1\frac{1}{16}}{1\frac{1}{8}}$ $\frac{1\frac{3}{16}}{1\frac{1}{4}}$ $\frac{1\frac{3}{8}}{1\frac{3}{8}}$ | $ \begin{array}{c} 1 \\ 1\frac{1}{8} \\ 1\frac{1}{8} \\ 1\frac{1}{4} \\ 1\frac{3}{8} \end{array} $ | 3/4 13/16 13/16 7/8 1 | $10\frac{3}{8}$ $10\frac{7}{8}$ $10\frac{7}{8}$ $11\frac{7}{8}$ $12\frac{1}{2}$ | 1.15 1.30 1.60 2.10 2.80 | 1.55 1.75 2.05 2.60 3.45 | 1.72 1.95 2.40 3.15 4.20 | 2.12 2.40 2.85 3.65 4.85 | 2.30 2.60 3.20 4.20 5.60 | 2.70 3.05 3.65 4.70 6.25 |

WRENCHES

DROP-FORGED STEEL SET-SCREW, SINGLE HEAD



Fig. 2982A

| No. | For Set- Screw Size Inches | Extreme Length Inches | Price Unfin- ished Each | Price Semi- Fin- ished Each | Price Fin- ished Each | No. | For Set- Screw Size Inches | treme Length | Price Unfin- ished Each | Price Semi- Fin- ished Each | Price Fin- ished Each |
|-----|-------------------------------------|-----------------------------|----------------------------------|---|--------------------------------|-----|-------------------------------------|-----------------|----------------------------------|---|--------------------------------|
| 92 | 3/16 | 3 | .08 | .12 | .16 | 98 | %6 | 71/2 | .27 | .41 | .54 |
| 93 | 1 1/ | 35/8 | .10 | .15 | .20 | 99 | 5/8 | 8 | .30 | .45 | .60 |
| 94 | 5/4 5/6 3/8 | 41/2 | .12 | .18 | .24 | 100 | 3/4 | 914 | .35 | .53 | .70 |
| 95 | 3 8 | 58/8 | .15 | .23 | .30 | 101 | 3/4 7/8 | 101/2 | .42 | .63 | .84 |
| 96 | 7/6 | 61/4 | .20 | .30 | .40 | 102 | 1 | 111/2 | .50 | .75 | 1.00 |
| 97 | 7/16 1/2 | 7 | .25 | .38 | .50 | 103 | 11/8 | 12 | .60 | .90 | 1.20 |

DOUBLE HEAD SET SCREW



| Number | For Set Screws Size, Inches | Extreme Length Inches | Price Untinished Each | Price Semi-Finished Each | Price Finished Each |
|--------|--|-----------------------------|-----------------------------|--------------------------------|---------------------------|
| 65 | 3/6 and 1/4 | 33 8 | .13 | .20 | .26 |
| 66 | 8 " 516 | 33/8 | .13 | .20 | .26 |
| 67 | 174 " 516 | 4 | .15 | .23 | .30 |
| 68 | 17 " 37 | 4 | .15 | .23 | .30 |
| 69 | 74 | 5 | .18 | .27 | .36 |
| 70 | 5/ " 7/ | 5 | .18 | .27 | .36 |
| 71 | 716 /16 3/ 4 7/ | 578 | 22 | .33 | |
| | 3 % " 16 3 % " 1 % | | | | .44 |
| 72 | 78 " 12 77 " 12 | 578 | .22 | .33 | .44 |
| 73 | 716 " 1/2 | 65% | .27 | .41 | .54 |
| 74 | 76 " 97 | 65 8 | .27 | .41 | .54 |
| 75 | 1/2 " 9/6 | 71/3 | .33 | .50 | .66 |
| 76 | 1.7 " 5% | 71/5 | .33 | .50 | .66 |
| 77 | 1.7 " 5.8 9.4 " 5.8 9.6 " 5.8 9.6 " 3.4 | 83 \$ | ,40 | .60 | .80 |
| 78 | 9/4 " 3/4 | 83 8 | .40 | .60 | .80 |
| 79 | 16 74 5 4 3/ | 10 8 | .48 | .72 | .96 |
| | 78 74 5 77 | | | | |
| 80 | 7.8 7.8 | 10 | .48 | .72 | .96 |
| 81 | %4 %8 | 113 8 | .58 | .87 | 1.16 |
| 82 | 34 " 1 | $11^{3}\mathrm{s}$ | .58 | .87 | 1.16 |
| 83 | 78 " 1 | 125 6 | .68 | 1.02 | 1.36 |
| 84 | 7% " 11% | 125 🖁 | .68 | 1.02 | 1.36 |

SPANNERS PIN SPANNERS



Fig. 2921A

Unfinished are plain forgings only. Semi-finished have pins milled, edges ground, and are case hardened all over. Finished have pins milled, and are polished and case hardened all over.

| Number | For Circle Diameter | Extreme Length | Pin will Finish Diameter | | PRICE, EACH | |
|--------|------------------------|-------------------|-----------------------------|------------|---------------|----------|
| Number | Inches | Inches | Inches | Unfinished | Semi-finished | Finished |
| 204 | 1 | 4 | 3/6 | .18 | .27 | .36 |
| 205 | 11/4 | 41/2 | 13 | .19 | .29 | .38 |
| 206 | 11/2 | 5 | 7 32 | .20 | .30 | .40 |
| 207 | 13/4 | 51/2 | 15 | .21 | .31 | .42 |
| 208 | 2 | 6 | 1/4 | .22 | .33 | .44 |
| 209 | 21/4 | 61/2 | 17 | .23 | .35 | .46 |
| 210 | 21/2 | 7 | 9 9 9 9 9 | .24 | .36 | .48 |
| 211 | 23/4 | 71/2 | 19 | .26 | .39 | .52 |
| 212 | 3 | 8 | 5/6 | .28 | .42 | .56 |
| 213 | 31/4 | 81/2 | 21 | .30 | .45 | .60 |
| 214 | 31/2 | 9 | 11 22 | .32 | .48 | .64 |
| 215 | 33/4 | 91/6 | 23 | .34 | .51 | .68 |
| 216 | 4 | 10 | 3/8 | .36 | .54 | .72 |
| 218 | 5 | 12 | 7/6 | .48 | .72 | .96 |
| 220 | 6 | 14 | 1/2 | .65 | .98 | 1.30 |



Unfinished have pins milled only. Semi-finished have pins milled, the edges ground and are case hardened all over. Finished have pins milled, and are polished all over, case hardened and lacquered. The pins are forged integral with the wrench.

| | Pins | | | Span | Length | | | PRICE, EACH | | |
|--------|------------------------------|---------------------------|------------------|-------------------------------|------------------------------|---------------------|-----------------|-------------------|----------|--|
| Number | Distance C to C Inches | Diam. Milled Inches | Length Inches | of Jaws in Clear Inches | from C. of Pins Inches | Thickness Inches | Unfin- ished | Semi- finished | Finished | |
| 418 | 1 | 3/6 | 316 | 11/6 | 41/2 | 3/16 | .15 | .22 | .30 | |
| 420 | 1!4 | 37 | $\frac{7}{32}$ | 33 | 5 | 3/6 | .17 | .26 | .34 | |
| 422 | 11/2 | 372 | 32 | 11/8 | 51/2 | 316 | .19 | .28 | .38 | |
| 424 | 134 | 37 | 372 | 13/8 | 6 | 32 | . 22 | .33 | .44 | |
| 426 | 2 | 1/4 | l i | 15% | 61/2 | 32 | .25 | .38 | .50 | |
| 428 | 214 | 1/1 | 1/4 | 17% | 7 7 | 37 | .29 | .43 | .58 | |
| 430 | 21/2 | 2 | 3.2 | $2^{^{\circ}_{32}}$ | 71/2 | 1 1/4 | .33 | .50 | .66 | |
| 432 | 234 | 32 32 | 32 | $2\frac{1}{12}$ | 8 2 | 1/4 | .38 | .57 | .76 | |
| 434 | 3 | 57 | 5/6 | $2\frac{19}{32}$ | 81/2 | î} | .43 | .64 | .86 | |
| 436 | 314 | 516 | 517 | 213,5 | 91/8 | 12 | .49 | . 74 | .98 | |
| 438 | 31/2 | 516 | 5/6 | $3\frac{1}{32}$ | 934 | 1,4 | .55 | .82 | 1.10 | |
| 440 | 334 | 3/8 | 3% | 317 | 103% | 1/4 | .62 | .93 | 1.24 | |
| 442 | 4 | 3/8 | 3/8 | $-3\frac{7}{16}$ | 11 | 174 | .70 | 1.05 | 1.40 | |

PIPE CUTTERS



BARNES THREE-WHEEL PIPE CUTTERS

| Number | 1 | 2 | 3 | 4 | 5 | 6 | 61/2 | 7 |
|---|--|---------------|-------|-------|--------------------------------|-------|---------------------------------|---------------------------------|
| Cut Pipeinches Priceeach Ex. Wheels "Ex. Wheel Pins, doz. | $\begin{array}{c} 4.50 \\ .25 \end{array}$ | $6.00 \\ .30$ | 10.00 | 20.00 | 4 to 6 30.00 .75 2.00 | 40.00 | 8 to 10 45.00 .75 2.00 | 9 to 12 50.00 .75 2.00 |

SAUNDERS PIPE CUTTERS

| Number | | 1 2 | 3 | 4 | 5 |
|------------------|------------|-------------|----------|-----------|--------|
| Cuts Pipe | inches 1/8 | to 1 1 to 2 | . 2 to 3 | 21/2 to 4 | 4 to 6 |
| Price | each 3. | 00 4.50 | 11.00 | 18.00 | 28.00 |
| " Extra Wheels | | 24 .32 | .60 | .60 | .60 |
| " " Block and Wh | eel " 1. | 25 1.75 | 2.75 | 3.50 | 4.00 |
| " " Rollers | " | 24 .32 | .50 | .50 | .60 |
| " Pins | | .10 | .15 | .15 | .15 |



| Number | | | 1 | 2 | 3 |
|------------|------------|---|-----|----------|---------|
| | | | | 1/2 to 2 | 1¼ to 3 |
| " Extra Wh | eels | " | .30 | .30 | .40 |
| | s <u>.</u> | | .30 | .30 | .40 |

STANWOOD PIPE CUTTERS

| Number | 1 | 2 | 3 |
|-----------------------------|----------|---------|--------|
| Cuts Pipe inches Price each | 1/8 to 1 | 34 to 2 | 2 to 3 |
| " Extra Wheels | .12 | .18 | 25 |
| " "Block and Wheel " | .40 | .65 | 1.25 |



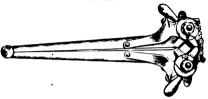


Fig. 5704E
"VOSPER" PIPE CUTTERS

| Cuts Pipe | inghag 16 to 9 |
|------------|--|
| Cam 1 1 po | |
| | The second secon |
| Price | each 16.00 |

PIPE CUTTERS, STOCKS, ETC.

ELLIS SOIL AND CAST IRON PIPE CUTTER



Fig. 813A

ELLIS SOIL PIPE CUTTERS

| Cuts | Pipeii | nches | 2 to 6 |
|------|------------------------|-------|-------------|
| | Extra Wheels | | 15.00 20 |
| " | Thumb Bolts and Nuts | | .20 |
| " | Wheel Pins and Cotters | . " | .10 |

ELLIS CAST IRON PIPE CUTTERS

| Number | 01 | 1 |
|---|----------|---------|
| Cuts Cast Iron Pipeinches | 3 to 8 | 4 to 12 |
| " Wrt. " " " " " Kalamein Lock Joint Pipe " Price | 31/2 " 8 | 4 " 12 |
| " Kalamein Lock Joint Pipe " | 4 9 | 5 " 13 |
| Priceeach | 32.00 | 55.00 |
| " Extra Wheels " | | .40 |
| " Thumb Bolts and Nuts " | .40 | .40 |
| " Wheel Pins and Cotters " | .20 | .20 |

Cuts pipe either in or out of the ditch.

TOLEDO DIE STOCKS

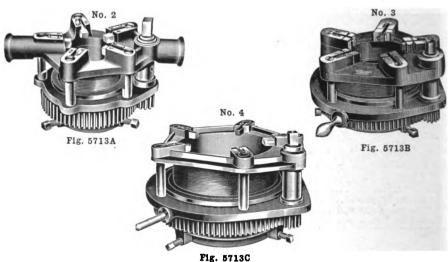
Nos. 10 AND 10A



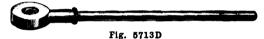
Fig. 813B

| Number | 10 | *10A |
|---|-----------------|--------|
| Threads Pipe inches Price each | 1 to 2 28 00 | 1 to 2 |
| " Extra Dies, Right Handper set of 4 segments | | 2.75 |

TOLEDO ADJUSTABLE DIE STOCKS



RATCHET HANDLE FURNISHED WITH No. 2, 3 AND 4 MACHINE



| Number | | 2 | 3 | 4 |
|---|------------|------------|--------------------------|-----------------------------|
| Threads Pipe | pounds | 60 | 4½ to 8 155 300.00 | 9, 10, 12, 225 500.00 |
| EXTRA DIES | FOR No. | 2 | | • |
| Sizeincl | hes 2½ | 3 | 31/2 | 4 |
| Number of Pieces | | 5 8.00 | 5 8.00 | 5 8.00 |
| EXTRA DIES | FOR No. | 3 | | |
| Sizeinches 41 | 2 5 | 6 | 7 | 8 |
| Number of Pieces 5 Price per set 12.0 | 0 | 5 12.00 | 5 12.00 | 5 12.00 |
| EXTRA DIES | FOR No. | 4 | _ | |
| Size | inches | 9 | 10 | 12 |
| Number of Pieces | | 5 20.00 | 20.00 | .5 20.00 |

No. 2 is a geared Adjustable Threading device, a boy can thread 4-inch pipe with this tool.

No. 3 is a geared Adjustable Threading device with which one man can readily thread 8-inch pipe, with clearance in other directions it may be operated on a pipe the center of which is within 10 inches of a wall or other obstruction.

No. 4 is a geared Adjustable Threading device with which one man can thread 9, 10 or 12 inch pipe. Its qualities will be appreciated by engineers of large power plants, Superintendents of pipe lines, etc.

TOLEDO ADJUSTABLE DIE STOCKS

"VOSPER" No. 0







Fig. 5714A

No. 1 A

Fig. 5714B



Fig. 5714C

Fig. 5714D

| Number | 0 | 1 | *1A | *1½R |
|--|-----------------|-----------------|-----------------|-------------------------------|
| Threads Pipe inches Price, Complete each | ½ to ¾ 16.00 | 1 to 2 24.00 | 1 to 2 30.00 | $2, 2\frac{1}{2}, 3$ $50, 00$ |

* With ratchet.

EXTRA DIES FOR No. 0

| Sizeinches | 1/8 | 14, 3 | 10.34 |
|------------------|------|-------|--------|
| | | | _ = '- |
| Number of Pieces | 4 | 4 | 4 |
| Price per set | 2 50 | 2.50 | 2.50 |
| | | | |

EXTRA DIES FOR No. 1 AND No. 1A

| Sizeinches | 1 | 11/4 | 11/2 | 2 |
|------------------|---|------|------|------|
| Number of Pieces | 4 | 4 | 4 | 4 |
| Priceper set | | 2.50 | 2.50 | 2.50 |

EXTRA DIES FOR No. 114R

| Sizeinches | 2 | 2^{1} | 3 |
|------------------|----------|---------|------|
| Number of Pieces | 4 | 4 | 4 |
| Priceper set | | 4.00 | 4.00 |

No. 0 is an entirely new production. It is 24 inches long from tip to tip of handle; $\frac{3}{4}$ and $\frac{1}{2}$ -inch pipe are threaded with the same set of dies, $\frac{3}{8}$ and $\frac{1}{4}$ with another set, and 1/8 with another.

No. 1 is an adjustable threading device. One man can readily thread 2-inch pipe with this tool with one hand.

No. 1A is in every essential the same as No. 1, except that it is equipped with a ratchet.

No. 1½R is an adjustable ratchet threading device for cutting 11½ pitch threads on tubing and line pipe. This tool can also be furnished for cutting a standard pipe threads on 21/2 and 3-inch pipe but is then limited to these two sizes. It operates with a ratchet only.

PIPE STOCKS AND DIES

MALLEABLE STOCKS AND DIES

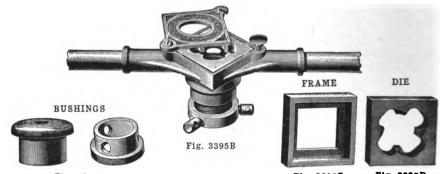


Fig. 3395A

Fig. 3395C

Fig. 3395D

| Number | Threads Pipe Inches | Dimensions of Dies Inches | Price, Complete Each | Price Stocks only Each | Price Extra Dies Each | Price Extra Bushings Each | Price Die Frames Each |
|---|---|---|--|--|--|---|--------------------------------|
| 0 1 1 ¹ / ₂ 1 ³ / ₄ 2 3 4 | 1/8 to 1/2 1/4 " 1 3/4 " 11/4 1 " 11/2 11/4 " 2 21/2 " 3 21/2 " 3 | 2 x ½ 2½ x ¾ 3 x ¾ 4 x ½ 5 x 1¼ 5 x 1¼ | 9.50 15.00 13.50 13.50 20.00 43.00 51.00 | 3.50 5.00 6.00 6.00 9.50 25.00 33.00 | 1.50 2.00 2.50 2.50 3.50 9.00 9.00 | .25 .35 .45 .45 .60 1.00 | 30 .40 .40 .50 .60 |

Numbers 2, 3, and 4 have Leader Screw. No. 4 has 4 arms.

MILLER'S REVERSIBLE RATCHET STOCKS



Fig. 3395E

| Number | Threads | Dimensions | Price | Price | Price | Price Extra | Extra Die |
|-----------------------|--|---|---|---|--------------------------------------|---------------------------------|--------------------------|
| | Pipe | of Dies | Complete | Stocks only | Extra Dies | Bushings | Frames |
| | Inches | Inches | Each | Each | Each | Each | Each |
| A B C D E | 18 to 34 14 " 1 1 " 1½ 1¼ " 2 2½ and 3 | 2 x ½ 2½x ¾ 3 x ¾ 4 x ½ 5 x ½ | 14.50 15.00 18.50 20.00 44.50 | 7.50 7.50 13.00 12.50 29.00 | 1.40 1.50 1.80 2.50 7.75 | .25 .25 .35 .45 .85 | .22 .30 .38 .45 |

Numbers C, D, and E have Leader Screws.

ARMSTRONG'S ADJUSTABLE PIPE STOCKS AND DIES





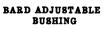
Fig. 3611A

Pig. 3611B

| | | | | | P | RICE, E. | АСН | | | |
|--------------------------|--|--|--|--------------------------------------|--------------------------------------|--------------------------|---------------------------|------------------------------|--------------------------|--------------------------|
| No. | Number of Dies | Threads Pipe Inches | Complete | Stock Only | Extra Dies Right or Left Hand | Extra Bushings | Extra Collar Screws | Extra Adjusting Screws | Extra Thumb Screws | Extra Wrenches |
| 1 2 21/2 3 3 | 4 Single End 5 " " 2 Double " 6 Single " | 1/8 to 1/2 1/4 " 1 1/2 " 11/4 1/2 " 2 11/4 " 2 | 9.00 12.00 12:00 33.00 20.00 | 3.25 4.00 4.50 7.00 7.00 | 1.25 1.50 3.25 4.00 4.00 | .20 .25 .40 .50 | .12 .12 .15 .15 | .10 .10 .15 .15 | .10 .10 .10 .15 | .25 .25 .25 .50 |
| 6 7 | 1 Double " 4 " " | $2\frac{1}{2}$ " $\frac{3}{2}$ 2 " $\frac{4}{2}$ " $\frac{4}{4}$ | 40.00 60.00 | 25.00 30.00 | 15.00 16.00 | 1.00 1.50 | .25 | .20 | | .50 .75 |

Prices for Dies are per set of two pieces, except No. 7, which is per set of four pieces. Nos. 6 and 7 have four arms.

RATCHET ATTACHMENTS





Pig. 3611C



Fig. 3611D

RATCHET ATTACHMENTS

| For Stock Number | 2 | 212 | 3 | 6 | 7 |
|------------------|----------|------|------|------|------|
| Priceeach | 2.50 | 3.00 | 3.50 | 5.00 | 5.00 |

BARD ADJUSTABLE BUSHINGS

| Number | 1 | 2 | 21/2 | 3 |
|----------------------------|----------------|----------------|----------------------|----------------|
| For Stocks Threadinginches | and smaller | and smaller | 1¼ and smaller | and smaller |
| Price each | 4.50 | 5.00 | 6.00 | 8.00 |

ARMSTRONG'S PIPE CUTTING AND THREADING MACHINES

FOR HAND OR POWER

No. 0

No. 00







Fig. 6115B

The No. 0 machine has been remodeled and strengthened in many ways. It works easier than the original No. 0 and is considered by all that have used the new model a most excellent machine. It is light, strong, compact, and durable; threads pipe from ¼ inch to 2 inches, and bolts ½ inch to 1½ inch, using the Armstrong Adjustable Dies. The No. 00 machine is like the No. 0 in general construction; is portable, strong,

The No. 00 machine is like the No. 0 in general construction; is portable, strong, durable, and fast; can be used for either hand or power, and changes from one to the other are easily and quickly made. It takes pipe dies from 1 inch to 4 inches inclusive, which are quick opening and adjustable. The cutting-off attachment is absolutely automatic, and of great practical use. The parts are all interchangeable and numbered.

| Numb | er | | | | | | | | | | 0 | 00 |
|--------|-------|------------|----------|---------|--------|-------|--------|--------|---------|------|-------------------------|--------------------|
| Size o | f R. | H. Pipe D |)ies | | | | | | in | ches | 1/4 to 2 1/5 to 11/6 | 1 to 4 1/2 to 2 |
| Price | Har | nd Machir | o with | Stand | with | out I | line | | | each | 60.00 | 125.00 |
| " | 66 | 46 | 44 | 66 | and | Pipe | Dies | | | " | 70.00 | 148.00 |
| 66 | 66 | " | 44 | 66 | 66 | Bolt | Dies | | | 44 | 73.00 | 150.00 |
| 6.6 | 46 | 4. | 46 | 44 | 44 | Pipe | and | Bolt | Dies | ** | 82.00 | 173.00 |
| 4.4 | Mad | chine, com | plete w | ith Sta | and. F | ipe D | ies. P | ower | Attach- | | | -10.00 |
| | | ment and | Count | ershaf | t | | | | | 66 | 113.00 | 218.00 |
| 44 | Por | ver Attach | ment. | | | | | | | 64 | 15.00 | 25.00 |
| 44 | Cou | untershaft | | | | | | | | 44 | 28.00 | 45.00 |
| 4.6 | Sta | nd | | | | | | | | 44 | 10.00 | 20.00 |
| +4 | Ext | ra Jaws fo | or Hold | ing Ro | ds | | | | | 66 | 10.00 | 5.00 |
| Speed | of (| Countersh | aft | | | r | evolu | itions | per mi | nute | 260 | 300 |
| Weigh | it of | Machine | with D | ies | | | | | por | inds | 170 | 475 |
| 4.6 | 66 | Power M | achine v | with I | Dies | | | | | 44 | | 580 |
| 4.6 | 66 | " A | ttachme | ent | | | | | | 66 | 30 | 120 |
| 4.4 | 44 | Stand | | | | | | | | " | 75 | 198 |
| 66 | 4.6 | Counters | haft | | | | | | | 26 | 100 | 206 |
| Rod J | aws | Hold Rod | | | | | | | in | ches | 1/1. 5/6. 3/8 | 1/6 to 1 |

Unless otherwise ordered, these Machines will be shipped with Stand and Pipe Dies, also for Hand Power.

When ordering with Power Attachment state whether Countershaft is wanted or not, as Countershaft will be shipped unless otherwise specified.

ARMSTRONG'S PIPE CUTTING AND THREADING MACHINES

FOR HAND OR POWER

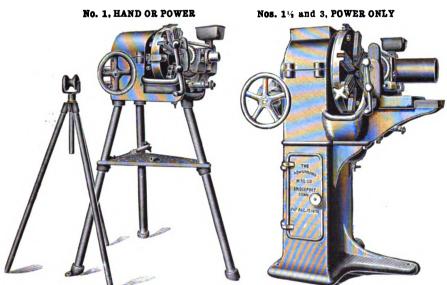


Fig. 6116A Fig. 6116B

These machines, like the adjustable Stocks and Dies, are constructed with a view of time and labor saving. They will cut off and thread pipe from 1 to 6 inches inclusive only requiring from two and a half to four minutes to thread pipe from 1 to 6 inches according to size. Of course, to run these, or any other machine, by hand power, the time consumed in threading pipe depends upon the activity of the man turning the crank. They will do the work as rapidly and easily as any machine on the market. They are so arranged that when cutting off pipe the dies are opened for the pipe to pass through, without being removed from the machine, by a simple motion of the hand wheel or lever.

| R.I | _ | |
|-----|---|-----|
| N | o | _ ` |

| Price, for Hand, with Right Hand Dies, 1 inch to 3 inches each " " " " " " " " " " " " " " " " " " " | | | | | | | | | | | - | | | | | | | |
|--|--------|------|--------|--------|-------|------|-------|-----|-----|----|---|-------|-----|------|------|----------|-------|-----|
| " " Power " " " " 1 " " 3 " " " " " " " " " " " " | Price, | for | Hand, | with | Right | Hand | Dies, | 1-i | nch | to | 3 | inche | s | | | | eac | h |
| " " " " " 1½" " 3 " " " " Countershaft " " " Power Attachment " " Weight of Machine for Hand pounds " " " Power " " Speed of Countershaft revolutions per minute | | ** | 46 | ** | 66 | 44 | | 1, | 6 " | 44 | 3 | -4 | | | | | . " | |
| " " " " " 1½" " 3 "" " Countershaft | | 44 | Power | 44 | 44 | 4.6 | 46 | 1 | ٠,٠ | 66 | 3 | 44 | | | | . | " | 1 |
| " Countershaft | 44 | " | " | 44 | 66 | 44 | 44 | 1 | 3 " | " | 3 | " | | | | | " | |
| " Power Attachment. " Veight of Machine for Hand pounds " " " Power " Speed of Countershaft revolutions per minute | | | | | | | | | | | | | | | | | | |
| " " " Power | " | | | | | | | | | | | | | | | | | |
| " " " Power | Weig! | ht o | f Mach | ine fo | r Han | d | | | | | | | | | | ' | pound | ls |
| <u> </u> | | | | | | | | | | | | | | | | | | - 1 |
| Non All AND O | Speed | l of | Counte | ershai | ft | | | | | | | re | vol | utio | ns r | er | minut | te |
| | | | | | | | Noc | | / 8 | · | _ | 2 | | | | | | - |

| Nos. 1½ AND 3 | | |
|--|--------|--------|
| Number | 11/2 | 3 |
| Cuts and Threads Pipeinches | 1 to 4 | 1 to 6 |
| Speed of Countershaft revolutions per minute | 325 | 325 |
| Weightpounds | 900 | 1250 |
| Priceeach | 316.00 | 550.00 |

FORBES PATENT DIE STOCKS With Opening and Adjustable Dies

FOR HAND No. 56

FOR HAND OR POWER No. 78





Fig. 7104A

Fig. 7104B

| | HAND MACHINES | | | | HAND OR POWER M. | ACHINES | |
|-------------|---|------------------------------------|-----------------|-------------|---|------------------------------------|------------------|
| Num- ber | Threads Pipe, Inches | Approx. Net Weight Pounds | Price Each | Num- ber | Threads Pipe, Inches | Approx. Net Weight Pounds | Price Each |
| *30 | 1/4 to 2, R. and L | 140 | 50.00 | | 14 to 2 R. and L | | 100.00 |
| *32 | For Solid Dies, ¼ to 2 | 138 | 45.00 | *72 | For Solid Dies 14 to 2 | 332 | 95.00 |
| *34 | Dies not furnished 1 to 3, R. H., 1 to 2 | 136 | 45.00 | *74 | Dies not furnished 1 to 3 R. H., 1 to 2 | | 85.00 |
| 01 | L.H. | 175 | 75.00 | | L.H | 401 | 125.00 |
| *36 | 1 1 to 3, R. H., 34 to 2 | | 1 | *76 | 34 to 3 R. H., 4 to | | |
| | L. H | 178 | 85.00 | | 2 L. H | 390 | 135.00 |
| *37 | 14 to 3, R. and L | 180 | 105.00 | *77 | 14 to 3 R. and L | 390 | 155.00 |
| *38 | 11/2 " 4, R. H | 238 | 100.00 | | 21 2 " 4 R. H | 552 | 140.00 |
| *40 | 11/2 4, IV. and II | 253 | 115.00 | | 11/2 # 10.11 | | 150.00 |
| *42 | 1 4, IV. II | 247 | 110.0 | | | | 165.00 |
| *44 | 1 1, IV, and II | $\frac{260}{237}$ | 130.00 85.00 | | 1 4 W. H | | 160.00 |
| †46 †50 | 2½ " 4, R. H | 330 | 115.00 | | 1 " 4 R. and L 4 " 6 R. H | | 180.00 170.00 |
| +52 | 4 | 335 | 130.00 | | 3½ " 6 R. H | | 180.00 |
| +54 | 2½ " 5, R. H | 338 | 150.00 | | 213 " 5 R. H | | 200.00 |
| 56 | 2½ " 6, R. H | 344 | 175.00 | | 21 ½ " 5 R. H | | 225.00 |
| * 58 | 1 " 6, R. H | 364 | 190.00 | | 21/2 " 6 R. and L | 718 | 255.00 |
| *60 | 1 " 6, R. and L | 387 | 235.00 | | 1 " 6 R. H | 789 | 250.00 |
| *61 | 21/2 " 6, R. and L | 357 | 205.00 | | 1 " 6 R. and L | | 285.00 |
| †62 | 21,2 " 6, R. H | 790 | 300.00 | *981/2 | 1 " 8 R. H | | 535.00 |
| *63 | 212 " 8, R. and L | 636 | 360.00 | *99 | 21/2 " 8 R. and L | 1289 | 535.00 |
| †64 | 2½ " 8, R. H | 648 | 325.00 | | 1 "8R. and L | | 570.00 |
| *65 | 1 " 8, R. H | 646 | 360.00 | | 2½ " 8 R. H | | 500.00 |
| *65½ | 1 " 8, R. and L | 635 | 395.00 | | 2½ " 10 R. H | 1971 | 700.00 |
| †66 | 2½ " 10, R. H | 964 | 500.00 | | $2^{1/2}$ " 10 R. H | | 700.00 |
| *67 | 2½ " 10, R. H | 970 | 500.00 | | $2^{1}\frac{7}{2}$ " 10 R, and L | | 750.00 |
| *68 | 212 " 10, R. and L | 1000 | 550.00 | | $2^{1\frac{7}{2}}$ " 12 R. H | 3600 | 900.00 |
| †69 | 21/2 " 12, R. H | 2026 | 650.00 | | $2\frac{1}{2}$ " 12 R. and L | 4031 | 1000.00 |
| *691 2 | 2½ " 12, R. and L | 2000 | 750.00 | | 1 | | · · · · · · · |

*Pressure Feed Machines.

tLead Screw Machines.

Numbers 30 to 37 and 70 to 77 have no cut-off attachment unless specially ordered. The prices of Hand or Power Machines include Countershaft, Ratchet Wrench and Pipe Rest.

JARECKI PIPE MACHINES

Nos. 6 to 7 B





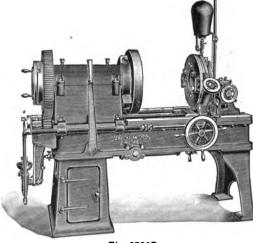


Fig. 8798A

Fig. 8798B

| No. | Range Inches | Weight Pounds | | Equipment | | Price Each | |
|-------------|-----------------|------------------|----------------|-----------|-----|---------------------------|---------|
| 6 | 1/4 to 2 | 720 | Hand | R. H. | Die | es | 153.00 |
| 6 | 14 " 2 | 760 | " | 66 | .66 | and Oil Pump | 175.00 |
| 6 7 7 | 14 " 2 | 916 | Hand and Power | 46 | 66 | " Countershaft | 162.00 |
| 7 | 14 " 2 | 955 | " " " | 44 | 66 | Countershaft and Oil Pump | 184.00 |
| 7A | 14 " 3 | 1050 | Hand | 44 | 66 | and Oil Pump | 400.00 |
| 7B | 14 " 3 | 1050 | Hand and Power | 44 | 44 | Countershaft and Oil Pump | 425.00 |
| | 1 " 4 | 1525 | Hand | 44 | 46 | and Oil Pump | 530.00 |
| 8 | 1 " 4 | 2228 | Belt | 44 | 66 | Countershaft and Oil Pump | 567.00 |
| 10 | 1 " 4 | 2480 | Engine | 44 | 66 | Engine and Oil Pump | 665.00 |
| 11 | 11/2 " 6 | 2800 | Belt | 66 | 66 | Countershaft and Oil Pump | 735.00 |
| 12 | 11/2 " 6 | 2818 | Engine | 44 | 66 | Engine and Oil Pump | 840.00 |
| 13 | 21/2 " 8 | 5550 | Belt | 46 | 44 | Countershaft and Oil Pump | 1200.00 |
| 14 | 21/2 " 8 | 6170 | Engine | 66 | 66 | Engine and Oil Pump | 1330.00 |
| 15 | 21/2 " 10 | 5800 | Belt | 46 | 44 | Countershaft and Oil Pump | 1635.00 |
| 16 | 21/2 " 10 | 6660 | Engine | 44 | ** | Engine and Oil Pump | 1780.00 |
| 17 | 21/2 " 12 | 8140 | Belt | 44 | 44 | Countershaft and Oil Pump | |
| 18 | 21/2 " 12 | 9000 | Engine | 44 | 66 | Engine and Oil Pump | 2110.00 |

2.3,4,6,8,10 and 12-inch with motors attached; prices on application. All f. o. b. Erie.

Can furnish extra dies for threading casing and line pipe; also for English and Whitworth Standard Threads.

These Pipe Machines are without doubt the best and most convenient machines of their kind made. The Dies are quick opening and adjustable. Each set of four pieces up to five inches, cuts two sizes of pipe, which is a great point in favor of the Machine when new dies are required.

There are no loose bushings on the Machine which, when required, cannot be found. Our Machine has on back end of Spindle an Adjustable Self-Centering Chuck to center the pipe. Also the same on Die Head, to steady the pipe when being cut with Cutting-Off Knife. The Gripping Chuck is self-centering, too, and very powerful.

PIPE VISES

HENDERER

No. 1B, 2B







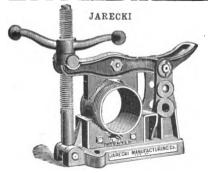


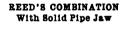


Fig. 2058A

Fig. 2058C

| Number | 1B | 2B | 1 | 2 | 18 | 30 | 1H | 2H | 3H |
|---------------------------------|-------------|-------------|----------|----------------|----------|--------|-------------|-------------|------------|
| Holds Pipe inches Price each | 1/8 to 21/2 | 1/4 to 31/2 | 1 8to2 ! | 1/8 to 3 | 1/4 to 4 | ½ to 6 | 1/8 to 21/2 | 1/4 to 31/2 | 1, to 41/2 |
| Price each | 10.00 | 14.00 | 8.00 | 12. 0 0 | 16.00 | 30.00 | 10.00 | 14.00 | 20.00 |





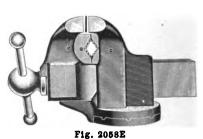


Fig. 2058D

JARECKI PATENTED

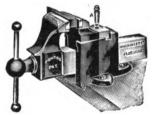
| Number | 1A | 2A | 3A | 4A |
|------------------|----------|----------|----------|---------|
| Takes Pipeinches | 1/8 to 2 | 1/8 to 4 | 11, to 6 | 6 to 12 |
| Priceeach | 12.00 | | 24.00 | 60.00 |

REED'S COMBINATION

| Number | 31 | 32 | 33 | 34 |
|--------------------|--------|-------------|-------------|--------|
| Kind of Base | Swivel | Swivel | Swivel | Swivel |
| Width of Jawinches | 31., | 41/4 | 5 | 6 |
| Capacity Pipe " | | 1/8 to 31/2 | 1/8 to 41/2 | ½ to 6 |
| Weightpounds | | 70 | 117 | 175 |
| Priceeach | 16.00 | 20.00 | 28.00 | 35.00 |
| "per set (3) | 1.50 | 1.75 | 2.00 | 3.00 |

PRENTISS VISES

MACHINISTS' SELF ADJUSTING JAW VISES
CTATIONARY BOTTOM SWIVEL BOTTOM





| Fig. 7427A | STAT | ONARY | BOTT | Fig. 7427B | | | |
|---------------------|----------------|---------------------------|----------------|------------|-------|-------|-------|
| Number | 1 | 2 | 2½ | 3 | 4 | 5 | 6 |
| Width of Jaw inches | | 31/2 | 4 | 41/2 | 51/4 | 6 | 7 |
| Opens " | 31/2 | $\frac{4\frac{3}{4}}{28}$ | $5\frac{1}{4}$ | 6 | 8 | 9 | 11 |
| Weight pounds | 131% | 28 | 41 | 54 | 96 | 146 | 184 |
| Price each | $5.5\tilde{0}$ | 7.00 | 9.00 | 10.50 | 17.00 | 24.00 | 30.00 |
| | SW | IVEL E | OTTO | VI | | | |

| Number | 18 | 19 | 191/2 | 20 | 21 | 22 | 23 |
|--|----------------------------|------------------------|---------------------|---|--|------------------------|-------------------------|
| Width of Jawinches Opens " Weight pounds Priceeach | 25/8 31/2 17 6 75 | 3½ 4¾ 32 8.50 | 51/4 46 10.50 | $ \begin{array}{r} 4\frac{1}{2} \\ 6 \\ 65 \\ 12.50 \end{array} $ | $ \begin{array}{r r} & 5\frac{1}{4} \\ & 8 \\ & 109 \\ & 19.00 \end{array} $ | 6 9 168 27.00 | 7 11 207 35.00 |

MACHINISTS' SOLID JAW "BULL DOG" VISES STATIONARY BOTTOM SWIVEL BOTTOM



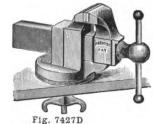


Fig. 7427C

STATIONARY BOTTOM

| Number | 50 | 51 | 52 | 53 | 54 | 55 . | 56 | 57 |
|--|-------------------------|--|---------------------------------|---|-----------------------|--|-------------------------|-------------------------|
| Width of Jaw inches Opens " Weight pounds Price each | $\frac{314}{4}$ 22 6.00 | $ \begin{array}{r} 3^{5}_{8} \\ 5\frac{1}{2} \\ 28 \\ 7.00 \end{array} $ | $\frac{41'_{8}}{6}$ 42 8.50 | $ \begin{array}{r} 4\frac{5}{8} \\ 7 \\ 52 \\ 10.00 \end{array} $ | 5 8 72 13.00 | $ \begin{array}{r} 5\frac{1}{2} \\ 9 \\ 100 \\ 18.50 \end{array} $ | 6 10 135 25.00 | 7 12 210 37.50 |

| SWIVEL BOTTOM | | | | | | | | |
|--|---------|---|---|--|-----------------------|--|-------------------------|---------------------------|
| Number | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 |
| Width of Jaw inches Opens " Weight pounds Price each | 4 28 | $ \begin{array}{r} 3^{5}_{8} \\ 5^{1}_{2} \\ 36 \\ 8.75 \end{array} $ | $ \begin{array}{r} 41_{8} \\ 6 \\ 52 \\ 10.50 \end{array} $ | $ \begin{array}{r} 4^{5} \\ 7 \\ 64 \\ 12.50 \end{array} $ | 5 8 85 16.00 | $ \begin{array}{r} 5\frac{1}{2} \\ 9 \\ 115 \\ 22.00 \end{array} $ | 6 10 155 30.00 | $7 \\ 12 \\ 235 \\ 42.50$ |

PRENTISS VISES

MACHINISTS' RAPID TRANSIT STATIONARY BOTTOM



Fig. 7428A

WOODWORKERS' "BULL DOG" STATIONARY BOTTOM



Fig. 7428B

MACHINISTS' RAPID TRANSIT STATIONARY BOTTOM VISES

| Number | 70 | 71 | 72 | 73 | 74 | 75 |
|---------------------------|---------------------|--|----------------------------|---------------------------|------------------------|--------------------------|
| Width of Jawsinches Opens | $22^{3\frac{1}{2}}$ | 3 ³ / ₄ 4 ¹ / ₂ 33 8.00 | 414 51/2 54 11.00 | 434 612 65 13.50 | 5½ 8 98 19.00 | 6¼ 9¼ 150 28.00 |

WOODWORKERS, "BULL DOG" VISES

| Number | 59, Stationary Bottom | 99, Swivel Bottom |
|--|-----------------------|--------------------------|
| Width of Jaw inches Opens " Weight pounds Price each | 9 48 | 4¼ 9 . 58 11.50 |

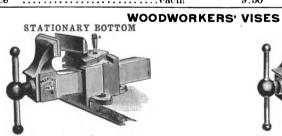


Fig. 7428C



Fig. 7428D

STATIONARY BOTTOM

| Number | 12 | 10 |
|---------------------------|------------|----------------------------------|
| Width of Jawinches Opens" | 31/2 | 41/2 |
| Weight pounds Price each | 30 8.00 | 59 ² 11. 00 |

SWIVEL BOTTOM

| Number | 27 | 26 |
|--------------------|------|-------|
| Width of Jawinches | 31/2 | 414 |
| Opens | 34 | 67 |
| Priceeach | 9.50 | 13.00 |

PRENTISS VISES

PATENT FILERS' OR FINISHERS'

STATIONARY BOTTOM



Fig. 9389A

SWIVEL BOTTOM



Fig. 9389B

No. 42, Stationary Bottom 41/4-inch Jaws, opens 51/4-inch, weight 42 pounds.each No. 47, Swivel Bottom 41/4-inch Jaws, opens 51/4-inch, weight 47 pounds.... "

 $8.00 \\ 10.00$

COMBINATION PIPE

MONARCH



Pig. 9389C

BLAKE



Fig. 9389D

MONARCH

| Number | 401 | 402 | 403 |
|---------------------------------|-------------|--------|--------|
| Width of Jaws inches Holds Pipe | 3½ | 4½ | 5 |
| | 1/2 to 21/3 | ½ to 3 | ½ to 4 |
| Weight pounds Price each | 44 | 65 | 110 |
| | 16.00 | 20.00 | 28.00 |

These vises can be furnished with stationary base, if so desired, at same prices.

BLAKE

| Number | | 183 | 185 |
|---------------|--------|-----|--------------|
| Width of Jaws | inahaa | | 7 16 to 8 |
| Weight Price | | | 240 60.00 |

These vises can be furnished with stationary base, if so desired, at same prices.

VISES

PARKER'S FILERS' VISES

STATIONARY BOTTOM No. 42 and 424







Fig. 7537A

| Number | 42 | 421/4 | 44 |
|---------------------|------|-------|------|
| Width of Jawsinches | 4 | 31/4 | 4 |
| Jaws Open | 41/4 | 31/2 | 41/4 |
| Weightpounds | _33_ | 30 | 37 |
| Priceeach | 7.25 | 6.75 | 8:75 |

STATIONARY BOTTOM

VULCAN

SWIVEL BOTTOM





Fig. 7537C

STATIONARY BOTTOM

Fig. 7537D

| Number | A | В | C | D | E | F | G |
|---------------------------|------|------|------|-------|-------|-------|-------|
| Width of Jawsinches | 31/4 | 35 8 | 41/8 | 45/8 | 5 | 51/2 | 6 |
| Jaws Open " Weight pounds | 25 | 31 | 48 | 61/2 | 75 | 105 | 150 |
| Priceeach | 6.00 | 7.00 | 8.50 | 10.00 | 13.00 | 18.50 | 25.00 |

SWIVEL BOTTOM

| Number | | | CC | DD | EE | FF | GG |
|----------------------------------|---------------------|---|--------------|--------------------|-------------|--------------|--------------|
| Width of Jaws inches Jaws Open " | $\frac{31_4}{51_2}$ | $\frac{35}{5}$ | 41/8 51/2 | 45/8 61/2 68 | 5 8 | 5½ 9 | 6 |
| Weight pounds Price each | | $\begin{array}{c} 37 \\ 8.75 \end{array}$ | 53 10.50 | | 86 16.00 | 119 22.00 | 156 30.00 |

EMMERT UNIVERSAL PATTERN MAKERS' VISES

NORMAL POSITION OF VISE ON BENCH WITH JAW AT AN ANGLE FOR TAPERED WORK VISE REVERSED TO HOLD WORK ABOVE

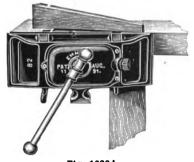




Fig. 4623A

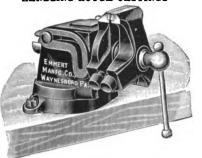
Fig. 4623B

| Number | 1 | 2 |
|-------------------|----------|----------|
| Size of Jawinches | 7 x 18½ | 5 x 14 |
| Opens | 14 86 | 12 56 |
| Priceeach | 15.00 | 12.50 |

The Emmert Universal Pattern Makers' Vise has six pairs of jaws, so that it is adapted to grasp any kind of work without regard to irregularity of form. The Emmert Universal Tool Makers' and Metal Workers' Vise is so constructed as to be used in any conceivable position. It is supplied with one set of grooved jaws to hold all classes of round work, one set of jaws which will hold any class of taper work, one set to hold copper work, and one set to hold any size ring. It is also supplied with a rough jaw for cast-iron work, with one smooth jaw for finished work.

EMMERT UNIVERSAL MACHINISTS' VISES

VISE IN ITS NATURAL POSITION FOR HANDLING ROUGH CASTINGS



VISE AT ANGLE TO BRING WORK TO A POSITION TO BE WORKED ON WITH CONVENIENCE TO THE WORKMAN

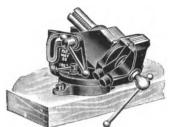


Fig. 4623C

Fig. 4623D

| Number | 4A | 5A | 6A | 10A |
|--------------------------|---------------------|------------|-------------|----------------|
| Size of Jawinches | 4 | 2 33/4 | 3 5 | 6 9 |
| Weight pounds Price each | $\frac{100}{12.50}$ | 12 7.00 | 55 10.00 | $230 \\ 22.50$ |

BLACKSMITHS' VISES

"FISHER" DOUBLE SCREW PARALLEL CHAIN LEG VISE



SOLID BOX VISE



"FISHER" DOUBLE SCREW PARALLEL CHAIN LEG VISES

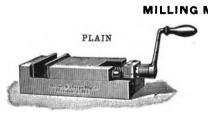
| Number | 1 | 2 | 3 | 4 | 5 | 6 |
|--------------------------|---------------|-------------|-----------|--------------|--------------|--------------|
| Size Jawsinches | 2x%6 | 4½x1 | 51/4×11/8 | 61/4×11/4 | 7x11/2 | 8x11/2 |
| Open " Diameter Screw " | $2rac{3}{4}$ | 11/2 | 11/4 | 11/2 | 9 1¾ | 17% |
| Length Lever " | 6 | 13 | 16 | 19 | 24 | 26 |
| Weightpounds Priceeach | 10.00 | 65 10.50 | 90 | 120 20.50 | 160 27.00 | 210 32.00 |

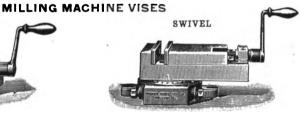
No. 1 not furnished with leg.

SOLID BOX VISES

| No. | Approx. Weight Pounds | Width of Jaw Inches | Price Each | No. | Approx. Weight Pounds | Width of Jaw Inches | Price Each |
|-----|-----------------------------|---------------------------|---------------|-----|-----------------------------|---------------------------|---------------|
| 25 | 25 | 33/8 | 12.00 | 105 | 105 | 6 | 23.00 |
| 30 | 30 | 31/2 | 11.00 | 110 | 110 | 61/4 | 24.00 |
| 35 | 35 | 4 | 10.00 | 115 | 115 | 61/4 | 25.00 |
| 40 | 40 | 4 | 10.50 | 120 | 120 | 61% | 26.00 |
| 45 | 45 | 41/4 | 11.00 | 125 | 125 | 61% | 27.50 |
| 50 | 50 | 41/4 | 11.50 | 130 | 130 | 634 | 29.00 |
| 55 | 55 | 41/2 | 12.00 | 135 | 135 | 63/4 | 31.50 |
| 60 | 60 | 41/2 | 13.00 | 140 | 140 | 7 | 33.00 |
| 65 | 65 | 5 | 14.00 | 145 | 145 | 7 | 35.00 |
| 70 | 70 | 5 | 15.00 | 150 | 150 | 7 | 36.00 |
| 75 | 75 | 51/4 | 16.00 | 160 | 160 | 71/4 | 41.50 |
| 80 | 80 | 51/4 | 17.50 | 170 | 170 | 71/4 | 44.50 |
| 85 | 85 | 51/2 | 18.50 | 180 | 180 | 8 | 47.00 |
| 90 | 90 | 51/2 | 20.00 | 190 | 190 | 8 | 53.00 |
| 95 | 95 | $53\frac{7}{4}$ | 21.00 | 200 | 200 | . 8 | 56.00 |
| 100 | 100 | 6 | 22.00 | | | | |

MILLING MACHINE AND DRILL PRESS VISES

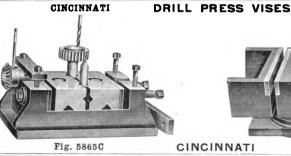


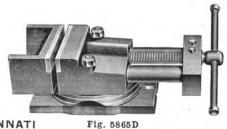


| Fig. 5865A | PLAIN | | Fig. 586 | 5B | |
|----------------|-------|--------------------|-----------------|--------------|-------|
| Number | | 1 | 2 | 3 | 4 |
| Width of Jawsi | | 41/8 | 51/8 | 61/8 | 71/8 |
| Depth. " " | " | $\frac{1}{2}^{16}$ | 23/4 | 1916 35/8 | 41/6 |
| Weightpe | ounds | 16 | $2\overline{4}$ | 43 | 78 |
| Price | .each | 12.00 | 13.00 | 18.00 | 28.00 |

SWIVEL

| Number | 2 | 3 | 4 |
|---------------------|-------|-------|-------|
| Width of Jawsinches | 51/8 | 61/8 | 71/8 |
| Depth " " " | 11/4 | 19/6 | 2 |
| Opens" | 234 | 35/8 | 63/2 |
| Height | 41/2 | 53/16 | 63/8 |
| Weightpounds | 40 | 70 | 110 |
| Priceeach | 18.00 | 25.00 | 36.00 |





TITUS

| Fig. 5865C | CINCINNATI |
|------------|------------|
| | |

| Number | 2 | 3 | 4 |
|-----------------------------|-------|-------|-------|
| Width of Jawsinches | 43/4 | 6 | 71/6 |
| Depth " " " | 176 | 1116 | 21/8 |
| Opens, both Blocks in place | 15/8 | 2 | 31/2 |
| " one Block removed " | 3 | 4 | 57/8 |
| " both Blocks "" | 41/2 | 6 | 81/4 |
| Weightpounds | 30 | 45 | 90 |
| Priceeach | 17.50 | 20.00 | 28.00 |

| Widt | th of Jav | vs | | | | | | | i | nches | 5 | 7 |
|-------|-----------|-------|-----|---------|------|------|------|------|-------|-------|-------|-------|
| Dept | h of Jav | ws | | | | | | | i | nches | 3 | 31/ |
| Open | S | | | | | | | | | 66 | 3 | 5 |
| Price | , Solid . | | | | | | | | | .each | 16.00 |) |
| 66 | Comb. | Swive | Bas | e | | | | | | . " | | 36.00 |
| 46 | " | 44 | 46 | without | Base | | | | | . 44 | | |

WOOD WORKERS' VISES

OLIVER QUICK ACTING

STYLE No. 155 ADJUSTABLE FRONT JAW

STYLE No. 157 SINGLE FRONT AND REAR JAWS





Fig. 487A

STYLE No. 155

Fig. 487B

| Number | | | | 155E | 155F |
|---|------|------|------|------|------|
| Jaws Open inches Weight pounds Price with 10-inch Jaws each | 12 | 14 | 16 | 18 | 20 |
| | 45 | 46 | 47 | 48 | 49 |
| | 7.00 | 7.50 | 8.00 | 8,50 | 9.00 |

STYLE No. 157

| Number | 157B | 157C | 157D | 157E | 157F |
|------------------------------|------|------|------|----------|----------|
| Jaws Openinches Weightpounds | 42 | 43 | 44 | 18 45 | 20 46 |
| Price with 10-inch Jawseach | 6.50 | 7.00 | 7.50 | 8.00 | 8.50 |

STYLE No. 153 SOLID FRONT JAW

STYLE No. 159 PLAIN WITH SOLID NUT

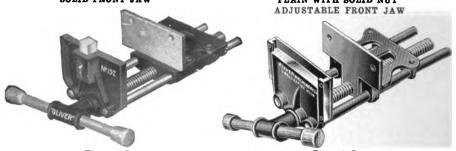


Fig. 487C

STYLE No. 153

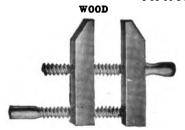
Fig. 487D

| Number | $\mathrm{BB} \mid 153\mathrm{C} \mid$ | 153D | 153E | 153F |
|---------------------------------|---------------------------------------|------|------|------|
| Jaws Openinches12Weightpounds22 | 2 14 | 16 | 18 | 20 |
| Weightpounds 22 | 2 23 | 24 | 25 | 26 |
| Price with 10-inch Jawseach 5.2 | 25 5.50 | 5.75 | 6.00 | 6.25 |

STYLE No. 159

| Number | 159B | 159C | 159D | 159E | 159F |
|--|------|------|------|------|------|
| Jaws Openinches | | | 16 | 18 | 20 |
| Weight pounds Price with 10-inch Jaws each | 35 | 36 | 37 | 38 | 39 |

HAND SCREWS





Pig. 5295A

Fig. 5295B

The jaws are of best grade, properly seasoned Michigan hard maple. The wood spindles are made of selected hickory stock, air seasoned.

The steel spindles are made of cold rolled steel, with a double thread working in a bronze nut.

WOOD

| Number | Diameter of Screw Inches | Length of Screw Inches | Length of Jaw Inches | Size of Jaw Inches | Opens Inches | Price per Dozer |
|--------|--------------------------------|------------------------------|----------------------------|--------------------------|-----------------|--------------------|
| 800 | 11/4 | 28 | 24 | 3 x3 | 17 | 40.00 |
| 801 | 11/4 | 26 | 22 | 23/4 x23/4 | 151/2 | 35.00 |
| 802 | 11/4 | 24 | 20 | 25/8 x 25/8 | 1334 | 32.00 |
| 803 | 11/4 | 22 | 20 | 21/2x21/2 | 12 | 30.00 |
| 804 | 11/8 | 22 | 18 | 21/2x21/2 | $12\frac{1}{4}$ | 28.50 |
| 805 | 11/8 | 20 | 18 | 23/8x23/8 | 101/2 | 27.00 |
| 806 | 1 | 20 | 16 | 23/8x23/8 | 11 | 25.00 |
| 807 | 1 | 18 | 16 | 21/4×21/4 | 91/4 | 23.50 |
| 808 | 7/8 | 18 | 14 | 21/8x21/8 | 10 | 22.00 |
| 809 | 7/8 | 16 | 14 | 2 x2 | 81/4 | 20.00 |
| 810 | 7/8 | 16 | 12 | 17/8×17/8 | 81/2 | 18.50 |
| 811 | 3/4 | 14 | 12 | 13/4 x 13/4 | 71/4 | 17.00 |
| 812 | 3/4 | 12 | 10 | 15/8×15/8 | 51/2 | 14.50 |
| 813 | 5/8 | 10 | 8 | 13/8×13/8 | 41/2 | 12.00 |
| 814 | 5/8 | 8 | 7 | 11/8x11/8 | 3 | 9.50 |
| 815 | 1/2 | 6 | 5 | 1 x1 | 2 | 8.00 |
| 816 | 3/8 | 5 | 4 | 7/8x 7/8 | 11/4 | 7.00 |

STEEL SPINDLE

| 900 | 7/8 | 28 | 24 | 3 x3 | 17 | 40.00 |
|-----|------|-----|----|-------------|-------|-------|
| 901 | 7/8 | 26 | 22 | 23/4 x23/4 | 151/2 | 35.00 |
| 902 | 7/8 | 24 | 20 | 25/8x25/8 | 133/4 | 32.00 |
| 903 | 7/8 | 22 | 20 | 21/2×21/2 | 12 | 30.00 |
| 904 | 3/4 | 22 | 18 | 21/2x21/2 | 121/4 | 28.50 |
| 905 | 3/4 | 20 | 18 | 23/8x23/8 | 101/2 | 27.00 |
| 906 | 3/4 | 20 | 16 | 23/8x23/8 | 11 | 25.00 |
| 907 | 3/4 | 18 | 16 | 21/4×21/4 | 91/4 | 23,50 |
| 908 | 5% | 18. | 14 | 21/8x21/8 | 10 | 22.00 |
| 909 | 1/2 | 16 | 14 | 2 x2 | 81/4 | 20.00 |
| 910 | 1/2 | 16 | 12 | 17/8x17/8 | 81/2 | 18.50 |
| 911 | 3/8 | 14 | 12 | 13/4 x 13/4 | 71/4 | 17.00 |
| 912 | -3/2 | 12 | 10 | 15/8×15/8 | 51/2 | 14.50 |
| 913 | 3/8 | 10 | 8 | 13/8×13/8 | 41/2 | 12.00 |
| 914 | 5/6 | 8 | 7 | 1½x1½ | 3 | 9.50 |
| 915 | 516 | 6 | 5 | 1 x1 | 2 | 8.00 |
| 916 | 5/16 | 5 | 4 | ₹/8x ₹/8 | 114 | 7.00 |

Parts, either screws or jaws, list one-third price of complete hand screw.



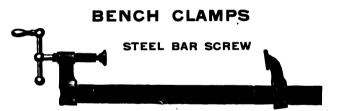


Fig. 164A

| Number | 232A | 232B | * 234A | 232C | * 234B | 232D | * 234C | 232E | *234D |
|---------------------------------|-------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Opensinches Priceper dozen | 10 10,00 | $\frac{12}{10.80}$ | $\frac{12}{15.60}$ | $\frac{15}{11.70}$ | 15 16.98 | $\frac{18}{12.60}$ | 18 18.36 | | $\frac{21}{19.74}$ |
| Number | 232F | *234E | 232G | * 234F | 232H | *234G | 2321 | *234H | 232J |
| Opens inches Price per dozen | | $\frac{24}{21.12}$ | $\frac{30}{16.20}$ | 30 23.88 | 36 18.00 | | $\frac{42}{19.80}$ | $\frac{42}{29.40}$ | 48 21.60 |
| Number | *2341 | 232K | *234J | 232L | *234K | 232M | * 234L | 232N | *234 M |
| Opensinches Priceper dozen | | $\frac{54}{23.40}$ | $\frac{54}{34.92}$ | $\frac{60}{25.20}$ | 60 37.68 | $\frac{66}{27.00}$ | 66 40.44 | $\frac{72}{28.80}$ | 72 43.20 |
| Number | 232P | *234N | 232Q | * 234P | 232R | * 234Q | 232S | * 234R | |
| Opensinches Priceper dozen | | 78 45.96 | $\frac{84}{32,40}$ | 84 48.72 | $\frac{90}{34.20}$ | 90 51.48 | 96 36,00 | 96 54.24 | |

*Heavy pattern.

STEEL BAR ECCENTRIC

| Number | 231A | 231B | * 233A | 231C | * 233B | 231D | * 233C | 231E | *233D |
|-------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Opensinches Priceper dozen | 10 10.00 | $\frac{12}{10.80}$ | $\frac{12}{15.60}$ | 15 11.70 | $\frac{15}{16.98}$ | $\frac{18}{12.60}$ | 18 18.36 | $\frac{21}{13.50}$ | $\frac{21}{19.74}$ |
| Number | 231F | * 233E | 231G | * 233F | 231H | * 233G | 231I | *233H | 231J |
| Opensinches Priceper dozen | $\frac{24}{14.40}$ | $\frac{24}{21.12}$ | 30 16,20 | $\frac{30}{23.88}$ | 36 18.00 | 36 26.64 | $\frac{42}{19.80}$ | $\frac{42}{29.40}$ | 48 21.60 |
| Number | *233I | 231K | * 233 J | 231L | * 233K | 231M | * 233L | 231N | *233M |
| Opensinches Priceper dozen | $\frac{48}{32.16}$ | $\frac{54}{23.40}$ | 54 34.92 | $\frac{60}{25.20}$ | 60 37.68 | 66 27.00 | 66 40.44 | $\frac{72}{28.80}$ | 72 43,20 |
| Number | 231P | *233N | 231Q | * 233P | 231R | * 233Q | 231S | * 233R | |
| Opensinches Priceper dozen | $\frac{78}{30.60}$ | $\frac{78}{45.96}$ | $\frac{84}{32.40}$ | $\frac{84}{48.72}$ | $\frac{90}{34.20}$ | $\frac{90}{51.48}$ | 96. 36.00 | 96 54.24 | |

*Heavy pattern.

WOOD CASE

| Number | 241A | 241B | 241C | 241D | 241E |
|-----------------|------|------|------|------|------|
| Opensinches | 24 | 36 | 48 | 60 | 72 |
| Price per dozen | 5.50 | 6.00 | 6.50 | 7.00 | 7.50 |



Fig. 161B

| Number | | | | | |
|------------------------------|---|------------|------------|------------|------------|
| Opens inches Price per dozen | $\begin{array}{c} 24 \\ 6.00 \end{array}$ | 36 6.50 | 48 7.00 | 60 7.50 | 72 8 00 |

CLAMPS

STANDARD CARRIAGE CLAMPS



| | п | |
|--|---|--|
| | | |

| Opensinches | 21/2 | 3 | 4 | 5 | 6 . | 7 | 8 | 9 | 10 | 12 |
|----------------|--------|-----|------|------|------|------|------|-------|-------|-------|
| Priceper dozen | 2.25 2 | .85 | 3.75 | 5.00 | 5.75 | 6.75 | 8.00 | 10.00 | 12.00 | 18.00 |

STEEL BOILER CLAMPS

BILLINGS DROP FORGED

STEEL "C" CLAMP



EXTRA HEAVY

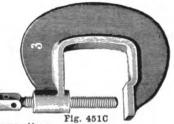


Fig. 451B

BILLINGS DROP FORGED STEEL "C" CLAMPS

| Number | 1 | 2 | 3 | 4 | 5 |
|--------------|------|------|------|------|-------|
| Opensinches | | 21/4 | 31/4 | 41/2 | 61/2 |
| Weightpounds | 5/16 | 2 | 51/4 | 71/2 | 111/2 |
| Priceeach | .75 | 1.75 | 2.50 | 3.25 | 4.00 |
| Screws " | 10 | .15 | .20 | .30 | .40 |

EXTRA HEAVY

| Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|-------------|------|------|------|------|------|------|-------|
| Opensinches | 2 | | 4 | 5 | 6 | 8 | 10 |
| Priceeach | 3.00 | 4.00 | 5.00 | 6.00 | 7.50 | 8.50 | 10.00 |









HEAVY STEEL CLAMPS

| Number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-------------|------|------|------|------|------|------|------|------|------|------|------|
| Opensinches | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| Priceeach | 1.75 | 2.00 | 2.25 | 2.50 | 2.75 | 3.25 | 3.75 | 4.25 | 5.00 | 6.00 | 7.00 |

| ŀ | 4 F | Δ1 | VV | ST | FF | -1 | RI | 21 | DG | F | LI A | MI | 25 |
|---|-----|----|----|----|----|----|----|----|----|---|------|----|----|
| | | | | | | | | | | | | | |

| Number | 12 | 13 |
|-------------|-------|-------|
| Opensinches | 24 | 30 |
| Priceeach | 12.00 | 16.00 |

MACHINISTS' CLAMPS

CLAMP DOG

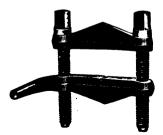


Fig. 2678A



Fig. 2678B

| Number | 00 | 0 | 1 | 2 | 3 | | |
|-------------------------|------------|-----------------------|------------------------------------|----------------------------------|----------------------------------|--|--|
| Distance between Screws | .75 .10 | 1½ 1.25 .10 | 13/4 1.50 .10 1.75 .12 | 2½ 2.00 .15 2.25 .18 | 2¾ 2.50 .20 2.75 .25 | | |
| Price, Plain | | | | | | | |

DIE DOG



Fig. 2678C

DIE DOG



Fig. 2678D

| Number | 1 | 2 |
|--|------------|-----------|
| Distance between Sides inches Price each | 1¼ 3.00 | 2 4.00 |
| " Extra Dies | .50 | .75 |

DROP FORGED MACHINISTS' CLAMPS

| Number | 1 | 2 | 3 | 4 |
|--|------|------|------|------|
| Opening inches Price each " Extra Screws " | 1½ | 21/4 | 3½ | 41/4 |
| | 1.50 | 2.00 | 2.50 | 3.00 |
| | .10 | .12 | .15 | .20 |

VULCAN DROP-FORGED LATHE DOGS

WITH BENT TAIL

WITH STRAIGHT TAIL

Nos. 1-13









Nos. 21-33

Nos. 32A-34A

Extra Heavy

Fig. 2986A

Fig. 2986B

Fig. 2986C

Fig. 2986D

These dogs, drop-forged from steel and the screws threaded U.S. Standard, are made of a special grade of steel well adapted to the purpose and are hardened and tempered.

| | Size Dog Inches | SIZE (| of Screw, I: | NCHES | Pric | Е ЕАСН |
|---|--|--|----------------|--|-------------------|---|
| Number | Inches | Diameter | Length | Hole in Head | Dogs | Extra Screws |
| 1 | 3 % | 5/16 3/8 | 11/4 | 1 | .40 | .06 |
| $ar{2}$ | 1,6 | 3.8 | 11/4 | | .50 | .07 |
| 1 2 3 4 5 6 7 8 9 | 3% | 7/6 | 15/8 | 1 | .50 .60 .70 | .06 .07 .08 .09 .10 .12 .16 .16 .22 .30 .50 .50 .65 .07 .08 |
| 4 | 1′ • | 7.6 1.2 2.5 11.6 11.6 11.6 3.4 7.8 7.8 | 2 | 1 1 | .70 | .09 |
| 5 | 11/4 | 1/2 | 214 | 1 | .85 | .09 |
| ő | 112 | 9/4 | 238 | 1 | 1.00 | .10 |
| 7 | $\frac{1}{2}$ | 5,8 | 213 | | 1.20 | .12 |
| ġ | 2.4 | ii Z | 23/ | | 1.40 | .16 |
| å | 214 | ii/c | 23/4 3 | | 1.70 | .16 |
| 10 | $\frac{\overline{2}}{3}$ | 3/4 | $3\frac{1}{4}$ | | 2.10 | .22 |
| 10 | 31⁄2 | 1 % | 31. | | 2.60 | .30 |
| $\begin{array}{c} 11 \\ 12 \end{array}$ | 4 | 7% | 33/4 | | 3.30 | .30 |
| 13 | 5 | 1 1° | 41/3 | | 6.00 | .50 |
| 12A | | 7/8 | 33% | | 5.00 | .30 |
| 13A | 5 | 1 1° | 41% | | 9.00 | .50 |
| 14A | 4 5 6 | l î | 51/2 | 1 | 14.00 | 65 |
| 91 | 3.4 | 54 | 112 | اقا | .40 | .07 |
| 99 | 12 | 3.5 | 11.7 | 32 | .50 | .08 |
| 02 | 3,8 1,2 3,4 | 72 | 15% | 1 | .60 | 09 |
| رب 04 | 1 14 | 1.5 | 2.8 | 1 12 | 70 | 10 |
| 24 95 | 11/4 | 1 12 | 21/ | 12 | .70 .85 | 10 |
| 20 96 | 112 | 92 | 28% | 12 | 1.00 | 12 |
| 21 22 23 24 25 26 27 | $ \begin{array}{c c} 11/2 \\ 13/4 \\ 2 \end{array} $ | 5/6 3 8 7/6 1 2 2 7/6 1 2 7/6 5 8 1/6 | 213 | 82 | 1.20 | 14 |
| 90 | 574 | 112 | 23/4 | 52 | 1.40 | 18 |
| 28 29 | 51∠ | 11,16 | 3 4 | 8/2 | 1.70 | 18 |
| 30 | $\frac{2\frac{1}{2}}{3}$ | 3/4 | 31/4 | 577 5/86 377 1/4 1/4 5/86 5/86 5/86 5/86 | 2.10 | 25 |
| 30 31 | 31/2 | 74 | 312 | 1 1/2 | 2.60 | 35 |
| 32 | 4 | 374 778 78 | 334 | 72 | 3.30 | 35 |
| 04 99 | 5 | 1 1 28 | 41% | 1/5 | 6.00 | .14 .18 .18 .25 .35 .35 .55 |
| 33 32A | 1 4 | 7/8 | 33/ | 1 2 1 | 5.00 | 35 |
| 52A | 11 5 | 1 1 28 | 412 | 1 1/4 | 9.00 | .55 |
| 33A | 5 6 | 1 1 | 514 | 1 72 | 14.00 | .75 |
| 34 A | ' ' | | 0/4 | 72 | 11.00 | |

DROP HEAD TOOLS



Fig. 4048A

Fig. 4048B

Fig. 4048C

| | Number | | | | Height from | | Price |
|--------------|-------------------|---------------|---|---------------------------------|---|---------------|-------------------------|
| Left Hand | Straight Shank | Right Hand | Size of Holder Inches | Size of Cutter Sq. Inches | Bottom of Shank to Cutter Point Inches | Price Each | Extra Cutter Each |
| 100L | 100S | 100R | 1/2x 5/8x 6 | 3/16 | 9/6 | 1.75 | .10 |
| 101L | 101S | 101R | 5/8x 3/4x 71/2 | 1/4 | 116 | 2.00 | .12 |
| 201L | 201S | 201R | 3/4 x 7/8 x 81/2 | 1/4 5/16 3/8 | 13/ 16 15/ 16 | 2.50 | .18 |
| 102L | 102S | 102R | 7/8x1 x 91/2 | 3/8 | 15/6 | 3.25 | .25 |
| 301L | 301S | . 301R | $1 x1\frac{1}{8}x10\frac{1}{2}$ | 7/16 1/2 5/8 | 11/16 | 4.00 | .35 |
| 103L | 103S | 103R | $1\frac{1}{8}$ x $1\frac{1}{4}$ x $11\frac{1}{2}$ | 1/2 | 13/6 | 5.00 | .45 |
| 104L | 104S | 104R | $1\frac{3}{8}$ x $1\frac{1}{2}$ x $13\frac{1}{2}$ | 5/8 | 15/16 | 7.50 | .65 |
| 105L | 105S | 105R | $1\frac{5}{8}$ x $1\frac{3}{4}$ x $15\frac{1}{2}$ | 3/4 | 11/2 | 12.00 | 1.00 |
| 106L | 106S | 106R | 17/8x2 x171/2 | 7/8 | 13/4 | 17.50 | 1.75 |
| 107L | 107S | 107R | $2\frac{1}{8}$ x $2\frac{1}{4}$ x $19\frac{1}{2}$ | 1 | 2 | 23.00 | 2.50 |

Prices include two self-hardening steel cutters and drop forged wrench.

PLANER TOOL



Fig. 4048D

GANG PLANER TOOL



Fig. 4048E

PLANER TOOLS

| Number | 40 | 401 | 41 | 42 | 43 | 44 | 45 |
|----------------------|----------|-----------|------------------------------------|--------------|-----------|---------------------------------|--|
| | ½x1x7 | | $\frac{3}{4}$ x1 $\frac{1}{2}$ x10 | 11/8x13/4x13 | | $1\frac{7}{8}$ x2\frac{1}{4}x19 | $2\frac{1}{8}$ x $2\frac{3}{4}$ x 22 |
| " "Cutter" | 14 x 3/8 | 5/6 X 7/6 | 3∕8 x 1∕2 | 1/2 x 3/4 | 5/8 x 7/8 | ¾ x1 | 7⁄8x1√8 |
| Price, Complete, ea. | 2.75 | 3.50 | 4.50 | 7.00 | 11.00 | 16.00 | 25.00 |
| " Bx. Cutters " | .20 | .30 | .40 | .70 | 1.00 | 2.00 | 3.00 |

Prices include two Self-Hardening Steel Cutters (ground to shape) and a Drop Forged Wrench.

GANG PLANER TOOLS

| Number | | 62 | 63 |
|---------------------|-----------------------|-------------|----------|
| Size of Shankinche | 11/4 x 1 3/4 x 7 1/2 | 15/8x21/4x9 | 2x214x11 |
| Length over all " | 10 | 12 | 14 |
| Size of Cutters " | 3/8 x 1/2 0 to 1/4 | 1/2×1/46 | %x 34 |
| Feed Adjustment " | 0 to 1/4 | 0 to 3% | 0 to 14 |
| Price, Complete eac | n 12.00 | 20.00 | 35.00 |
| " Extra Cutters " | .35 | .60 | 1.00 |

Prices include one set of Self-Hardening Steel Cutters (ground to shape), one Gauge for grinding cutters and one Wrench.





Fig. 2683A ______Fig. 2683B

| Num | BER | Size Shank | Price | Price |
|--|--|--|--|--|
| Left Hand | Right Hand | Inches | Each | Extra Cutter Each |
| 69L 70L 71L 72L 73L 74L 75L 76L | 69R 70R 71R 72R 73R 74R 75R 76R | 5/6x 3/4 3/8x 7/8 1/2x11/8 5/8x13/8 3/4x15/4 7/8x13/4 1 x2 | 2.00 2.20 2.40 3.00 3.90 4.90 6.50 8,50 | .40 .45 .55 .75 1.15 1.35 1.85 2.50 |

Prices include one Self-Hardening Steel Cutter (ground to shape) and a Drop Forged Wrench.

THREADING TOOLS



Fig. 2683C

| | ,. =0000 | | | |
|--|------------------------------------|-----------------------------------|------------------------------|----------------------------|
| Number | 00T | 50 | 51 | 52 |
| Size of Shankinches Price, Complete, V. or U. S. Cutter. each " "Whitworth " . " | 5/16 x 3/4 x 5 2 . 25 2 . 50 | 3/8 x 7/8 x 5 2 . 25 2 . 50 | 1/2 x11/8 x6 2.75 3.10 | 5/8x13/8x7 3.50 4.00 |
| Number | 53 | 54 | 55 | |
| Size of Shank inches Price, Complete, V. or U.S. Cutter each " Whitworth " " | 34 x15/8 x8 4.50 5.00 | 7/8x13/4x9 5.50 6.00 | 1x2x10 7.00 7.70 | |

Prices include one Single Point Cutter and a Drop Forged Wrench.

LIST OF CUTTERS FURNISHED

| Number | Chaser Cutters Pitches | Single Point Cutters Pitches | | | | |
|---|--|---|--|--|--|--|
| 00T and 50 51 52 53, 54 and 55** | 14, 16, 18, 20, 24* 11½* 12, 13,† 14, 16, 18, 20, 24* 8, 9, 10, 11, 11½* 12, 13,† 14, 16, 18, 20 8, 9, 10, 11, 11½*,* 12, 13,† 14, 16, 18, 20 | 6 to 20 Inclusive Standard 5 " 20 " Pitches 4 " 20 " 3 " 20 " | | | | |

*Made in V thread only. †Not made in Whitworth. **Single Point Cutters only.

| For Tool No | 00T a | nd 50 | 5 | 1 | 5 | 2 | 53 aı | nd 54 | 55 |
|----------------|-----------------|--------|-----------------|--------|-----------------|--------|-----------------|--------|-------------------------|
| KIND OF THREAD | Single Point | Chaser | Single Point | Chaser | Single Point | Chaser | Single Point | Chaser | Single Point Only |
| Sharp V | | . 90 | .55 | 1.05 | .70 | 1.20 | .90 | 1.30 | 1.25 |
| U. S. Standard | | .90 | .60 | 1.05 | .75 | 1.20 | .95 | 1.30 | 1.35 |
| Whitworth | . 75 | 1.25 | .90 | 1.40 | 1.15 | 1.65 | 1.40 | 1.80 | 1.95 |

In ordering Tools and Cutters for U.S. or Whitworth standard, be careful to specify exact pitch or number of threads per inch.

Tools equipped with single point sharp V Cutter will always be shipped unless otherwise specified.

CUTTING-OFF TOOLS STRAIGHT SHANK



Fig. 2883A

LEFT-HAND OFF-SET

RIGHT-HAND OFF-SET





Flg. 2883B

Fig. 2883C

| Number | | | Size of Shank | Size of Shank Size of Blades | | Price | |
|----------------------|-------------------|-----------------------|-----------------------|--------------------------------|----------|----------------------|--|
| Left Hand Off-Set | Straight Shank | Right Hand Off-Set | Inches | Inches | Complete | Extra Blades Each | |
| 29L | 19 | *29R | 5 ₁₆ x 3/4 | 5 X 1/2 | 1.65 | .25 | |
| 30L | 20 | 30R | 3 x 7/8 | 3 x 5/8 | 1.65 | .25 | |
| 31L | 21 | 31R | 1/2 x 11/8 | 1/8 x 3/4 | 1.80 | .35 | |
| 32L | 22 | 32R | 5 8 x 13 8 | 1/8 x 7/8 | 2.30 | .45 | |
| 33L | 23 | 33R | 34 x 11/2 | 3/6 x 1 | 3.00 | .60 | |
| 34L | 24 | 34R | 7/8 x 15/8 | 3% x 11/8 | 3.80 | .75 | |
| 35L | 25 | 35R | 1 x 17/8 | 17 x 11/4 | 4.75 | .95 | |
| 36L | 26 | 36R | 11/8 x 2 | 4 x 13/8 | 6.50 | 1.25 | |

^{*}Formerly listed as No. 00-C.

Prices include one Self-Hardening Steel Blade and a Drop Forged Wrench.

SIDE TOOLS

LEFT HAND, STRAIGHT SHANK

RIGHT HAND, STRAIGHT SEANK





Fig. 2883D

Fig. 2883E

| Nu | MBER | Size of Shank | Price | Price |
|-----------|------------|---|----------|-----------------------|
| Left Hand | Right Hand | Inches | Complete | Extra Cutters Each |
| 79L | 79R | 5/6 x 3/4 x 41/2 | 2.00 | .40 |
| 80L | 80R | 3 x $\frac{7}{8}$ x 5 | 2.20 | .45 |
| 81L | 81R | 12 x 118 x 6 | 2.40 | .55 |
| 82L | 82R | 5% x 114 x 6 | 3.00 | .75 |
| 83L | 83R | $\frac{3}{4} \times \frac{1}{2} \times \frac{7}{2}$ | 3.90 | 1.15 |
| 84 L | 84R | 1 x 134 x 9 | 4.90 | 1.35 |
| 85L | 85R | 11/8 x 2 x 11 | 6.50 | 1.85 |
| 86L | 86R | 11/4 x 21/4 x 13 | 8.50 | 2.50 |
| 87L | 87R | $_{-1} 1\frac{1}{2} \times 2\frac{3}{8} \times 15$ | 12.00 | 3.75 |

Each tool is carefully packed in a cardboard box, and price includes a Drop Forged Wrench and one Self-Hardening Steel Cutter, ground to shape.

STRAIGHT SHANK



LEFT HAND OFF-SET

Fig. 2408A

RIGHT HAND OFF-SET





| | Number | | Size of Inc | | Size of Holder | Size Weight | | Price | Price |
|-----------|----------|------------|--|--------------------------|-----------------|-------------|-----------------------|-------|-------|
| Left Hand | Straight | Right Hand | Inches | of Cutters Sq. Inches | Pounds | Each | Extra Cutters Each | | |
| 00-L | 00-S | 00-R | 5/6 x 3/4 x 41/2 | 3/16 | 1/2 | 1.60 | .10 | | |
| 0-L | 0-S | 0-R | $\frac{3}{8}$ x $\frac{7}{8}$ x 5 | 1/4 | 3/4 | 1.65 | .12 | | |
| 1-L | 1-8 | 1-R | $\frac{1}{2}$ x1 $\frac{1}{8}$ x 6 | 5/16 | 11/4 | 1.80 | .18 | | |
| 2–L | 2-S | 2-R | $\frac{5}{8}$ x1 $\frac{3}{8}$ x 7 | 3/8 | 2 | 2.30 | .25 | | |
| 3-L | 3-S | 3-R | $\frac{3}{4}$ x $\frac{15}{8}$ x 8 | 7/6 | 3!4 | 3.00 | .35 | | |
| 4-L | 4-S | 4-R | $\frac{7}{8}$ x $1\frac{3}{4}$ x 9 | 1/2 5/8 | 41/2 | 3.80 | .45 | | |
| 5-L | 5-S | 5-R | 1 x2 x11 | 5/8 | $71\sqrt{2}$ | 4.75 | .65 | | |
| 6-L | 6-S | 6-R | $1\frac{1}{4}x2\frac{1}{4}x13$ | 3/4 | $11\frac{1}{2}$ | 7.00 | 1.00 | | |
| 7-L | 7-S | 7-R | $1\frac{1}{2} \times 2\frac{1}{2} \times 16$ | 7.8 | 20 | 12.00 | 1.75 | | |
| 750-L | 750-S | 750-R | $1\frac{5}{8}$ x $2\frac{1}{2}$ x 18 | 1 | 25 | 17.50 | 2.50 | | |
| 800-L | 800-S | 800-R | $1\frac{3}{4}$ x $2\frac{3}{4}$ x 20 | 11/8 | 37 | 23.00 | 3.25 | | |

Each tool is carefully packed in a cardboard box, and price includes one drop forged wrench and two self-hardening steel cutters, ground to shape.

Nos. 00B To 13

BORING TOOLS

Nos. 108 To 115





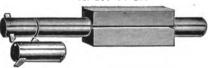


Fig. 2408E

| Number | Size of Shank Inches | Diameter of Bar Inches | Length of Bar Inches | Size of Cutter Sq. Inches | Weight Pounds | Price Each | Price ExtraCutters Each |
|--------|-------------------------|------------------------------|----------------------------|------------------------------|------------------|---------------|-------------------------------|
| 00B | 5/6 X 3/4 | 1/2 | 8 | 3/16 | 13/4 | 3.00 | .12 |
| 8 | 3/8 x 7/8 | 9/6 | 9 | 3/16 | 2 | 3.00 | .12 |
| 9 | 1/2 x 11/8 | 3/4 | 11 | 1/4 | 4 | 3.60 | .15 |
| 10 | 5% x 13% | 15/6 | 13 | 5/16 | 75/16 | 4.75 | .20 |
| 11 | 3/4 x 15/8 | 11/8 | 16 | 3/8 | 125/6 | 6.75 | .30 |
| 12 | 7/8 x 13/4 | 15/6 | 18 | 7/6 | 173/4 | 10.00 | .40 |
| 13 | 1 x 2 | 11/2 | 21 | 1/2 | 26 | 14.00 | .50 |
| 108 | 3/4 x 7/8 | 976 | 9 | 3/6 | 11/2 | 2.50 | .12 |
| 109 | 1 x11/8 | 3/4 | 11 | 1/4 | 3 | 3.00 | .15 |
| 110 | 11/4 x 13/8 | 15/6 | 13 | 5/16 | 53/4 | 4 00 | .20 |
| 111 | 11/2 x 15/8 | 11/8 | 16 | 3/8 | 914 | 5.75 | .30 |
| *112 | 134 x 17/8 | 15/6 | 18 | 7/6 | 1434 | 8.00 | .40 |
| †113 | 2 x 21/8 | 11/2 | 21 | 1/2 | 211% | 10.50 | .50 |
| 1114 | 21/4 x 23/8 | 113/16 | 24 | 5/8 | 3334 | 13.75 | .70 |
| 115 | 23/4 x 27/8 | 214 | 30 | 3/4 | 66 | 18.50 | 1.00 |

^{*} Formerly listed as No. 15. † Formerly listed as No. 16. ‡ Formerly listed as No. 17.

KNURLING TOOLS, DRILL HOLDERS, ETC.



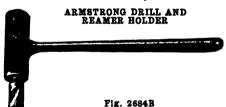


Fig. 2684A

þ

| K | NI | IR | 1 11 | NG | TO | OΙ | 9 |
|---|----|----|------|----|----|----|---|
| • | | UN | _,, | 10 | | - | 3 |

| Number | 1-K |
|---|----------------|
| Size Shank inches Price complete with one pair of Knurls | ½ x 1½ 4 50 |
| Price, complete with one pair of Knurlseach "Extra Knurlsper pair | .75 |

ARMSTRONG DRILL AND REAMER HOLDERS

| Number | 1 | 2 | 3 | 4 | 5 |
|--------------------|----------|----------|------|----------|--------|
| Holds Drillsinches | 16 to 18 | 31 to 32 | 1.60 | 111 to 2 | 2 to 3 |
| Weight pounds | 134 | 2% | | 71/2 | 14 ½ |
| Priceeach | .90 | 1.20 | | 2.60 | 4.00 |

These Holders have Morse Standard Taper Sockets.

ARMSTRONG PLANER JACK

OUICE ACTION DRILL VISE





Fig. 2684C

ARMSTRONG PLANER JACKS

| Fig. | 26 | 84 | D |
|------|----|----|---|
|------|----|----|---|

| Number | 1 | 2 | 3 | 4 |
|--|-------------------|----------------------|---------------|-------------------|
| Height Contracted inches "Extended " Weight pounds | 234 334 184 | 33/4 51/4 31/6 | 5¼ 7¼ 6 | 714 12 1246 |
| Priceeach | 1.00 | 1.50 | 2.00 | 3.00 |

These Jacks can be locked to any desired height (within their range) and when so locked cannot be jarred down.

QUICK ACTION DRILL VISES

| Number | 1-V | 2-V | 3-V |
|---|------|------|-------|
| Width of Jawinches | 2 | 23/4 | 314 |
| Depth " " " " " " " " " " " " " " " " " " " | 15/6 | 1% | 132 |
| Opens " | 1% | 21.3 | 3 |
| Weightpounds | 41/2 | 814 | 16 |
| Price each | 6,00 | 9.00 | 14.00 |

SLOTTER TOOLS, THREE BAR BORING TOOLS, ETC. SLOTTER TOOLS



Fig. 7987A

| Number | | 92 | 93 | 94 | 95 |
|-------------------|--------------------|---------------|---------------|---|--------------|
| For Slotterinches | 6 and 8 | 10 and 12 | 14 and 16 | 18 and 20 | 22 and 24 |
| Diameter of Bar " | 11/2 | 2 | 21/4 27 | | |
| Length Over All " | 1 10 | 22 | | $\begin{array}{c c} 2\frac{1}{2} \\ 32 \end{array}$ | 2¾ 37 |
| Size of Cutter " | 7/6 x 9/6 20.00 | 16 x 11/4 | %x 3/ | | %x1 |
| Price*each | 20.00 | ½x¼6 30.00 | %x ¾ 45.00 | 5% x 7% 65.00 | %x1 95.00 |
| " Extra Cutters " | .50 | .65 | .85 | 1.15 | 2.00 |

*Price includes Drop Forged Wrench and Two Self-Hardening Cutters.

THREE BAR BORING TOOL

GRINDING HOLDER

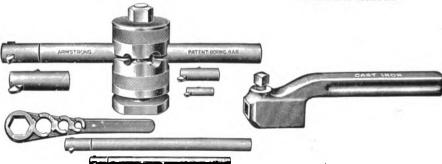


Fig. 7987B

· Fig. 7987C

THREE BAR BORING TOOLS

| Number | $\frac{1}{2}, \frac{3}{4}, \frac{11}{8}$ | 9/6, 15/6, 15/6 9, 13, 18 | $\frac{3}{4}$, $\frac{11}{8}$, $\frac{11}{2}$ | 13 18 24 |
|----------------------------------|--|------------------------------|---|---------------------------|
| ength " " " | 8, 11, 16 | 1 9, 13, 18 | 1 11, 16, 21 | 13 18 24 |
| | | ,, | | |
| Size of Cutters, Square | 3/6, 1/4, 3/8 | 86, 56, 76 | 14, 38, 12 | 5/6, 7/6, 5/8 24 to 32 |
| Swing of Lathes | 14 to 16 | | 20 to 22 | 24 to 32 |
| Price complete | 19.00 | | 91.00 | 28.00 |
| Veightpound Price completeper se | s 20 | 30 16.00 | | 48 21.00 |

A set comprises the holder and three patent boring bars with straight and 45 degree end caps and cutters, a piece of each size steel for extra cutters and a combination wrench.

GRINDING HOLDERS

| Number | 1-G | 2-G | 3-G | 4-G | 5-G |
|--|----------|----------|----------|----------|-----------------------------------|
| Size, Cutter holdsinches Weightpounds | 376. 1/1 | 5/6, 3/8 | 7/6, 1/2 | 5/8, 3/4 | $\frac{7}{8}$, 1, $\frac{11}{8}$ |
| Price each | .30 | .35 | .45 | .60 | .85 |

NOVO TOOL STEEL

FOR LATHE, PLANER AND CUT-OFF TOOLS







Fig. 5884A

Fig. 5884B

Fig. 5884C

| Sizeinches | 3 5x3/4 | ½x1 | 5 8x114 | 34x11/2 | 1x2 |
|-------------------------------|--------------|---------------|--------------|------------|-----|
| Price, Section Iper pound "Z" | . 76 . 76 | . 76. . 76 | . 76 . 76 | .76 .76 | .76 |

Note that lathe and planer tools are formed by grinding only; also that less steel is required to make the tool.

NOVO STEEL CLASSIFICATION Extras per 100 Pounds SMALL FLATS

| 1/4x11/8 | inche | s | | | | | | | | | | | | • • • • | Base |
|----------|-------|-----|--------|---|------|------|------|------|------|------|------|-----|------|---------|------|
| 5 x 1 | " | and | smalle | r | | | | | | | | ••• | | | .15 |
| 3%x4 | " | 44 | " | | | | | | | | | | | | 15 |

HEAVY FLATS

Are double those of the English extra prices for Carbon Tool Steel.

ROUND, SQUARE AND OCTAGON

| 21/8 to 3 inches | .02 | 51/8 to 51/2 inches | .12 |
|--|-----|---------------------|---------------------|
| $3^{1}\frac{3}{8}$ " $3^{1}\frac{1}{2}$ " | .04 | 55% " 6 " | .14 |
| 3% 4 | .06 | 6½ and larger | . 16 . 20 |
| $\frac{1}{4}\frac{5}{8}$ " $\frac{5}{2}$ " | .10 | l' | |

SMALL ROUNDS AND SQUARES

| 3/8 to 2 inches, Round, Square or Octagon | | |
|---|-----|--|
| %-inch, Round 数 and %-inch, Round | .75 | |

Annealing, per lb., .05. If Novo Tool Steel is not Annealed, it is hard and cannot be machined.

Section I, for Cut-off Tools: Section Z, for Lathe and Planer Tools.

HAND-FORGED TOOL HOLDER BITS



Fig. 5884D

| Sizeinches | | | 716 1/2 | | 7.8 1 |
|--------------------------------|-----------|-----------|-------------|--------------|---------------|
| Length inches | 11/2 2 | 21/2 3 | 31/2 4 | 41/2 5 | 6 7 |
| Lengthinches Priceper dozen | 1.80 2.15 | 2.40 3.60 | 4.80 6.00 | 9.00 15.00 | 24.00 42.00 |

No forging, hardening or grinding necessary.

In ordering, always state whether right or left handed tool bits are wanted.

EXPANDING MANDRELS





Fig. 6345B

SET A

| Number | Range Inches | Total Length Inches | Length of Jaws Inches | | Number | Range Inches | Total Length Inches | Length of Jaws Inches | |
|----------------------|--|-------------------------------|-----------------------------|----------------------------------|-------------------------|---|-------------------------------|-----------------------------|----------------------------------|
| 1A 3A 5A 7A | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 75/8 81/2 91/4 101/2 | 3 3½ 4 4½ | 10.75 12.00 14.75 17.00 | 9A 11A 13A 15A | 17/8 to 2 1/2 2 1/2 " 25/8 25/8 " 31/6 31/6 " 31/2 | 113/4 14 153/4 171/8 | 5½ 6½ 7 7½ | 21.00 26.75 33.50 39.50 |

Price per set 170.00, consisting of 8 mandrels, each with 2 sets of jaws.

SET B

| | | | 1 11 | | 1 4 5 4 4 0 3 | 112/ | 71/ | 17 50 |
|---------|--|--------------------------------|-------|----|--|-------|-----------------|-------|
| 1 | 1 to 154 | 758 + 3 | 8.75 | 9 | 17/8 to 23 | 1134 | $5\frac{1}{8}$ | 17.50 |
| $ar{2}$ | $1\frac{5}{64}$ " $1\frac{5}{32}$ | 75/8 3 | 8.75 | 10 | 2^{3}_{64} " 2^{7}_{32} | 1134 | $51\frac{7}{8}$ | 17.50 |
| 3 | 1 5 4 11/ | 81/2 31/2 | 9.80 | 11 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | 14 | $6\frac{1}{2}$ | 22.00 |
| 3 | 13 " 14 | 81/2 31/2 | | | 527 " 552 | 14 | $6\frac{1}{2}$ | 22.00 |
| 4 | 1 1/4 1 1 1 1 1 1 1 1 | $8\frac{1}{2}$ $3\frac{1}{2}$ | 9.80 | 12 | 257 " 258 | | 072 | |
| 5 | 111 " 127 | 91/4 4 | 12.00 | 13 | 25/8 " 23/2 | 153/4 | 7 | 27.50 |
| ĕ | 1 22 " 1 2 | 914 4 | 12.00 | 14 | 237 " 316 | 153/4 | 7 | 27.50 |
| ğ | 1 9 4 123 | 1012 | 14.25 | 15 | 31/16 " 3 1/2 | 171/8 | 71/2 | 32.25 |
| 7 | 1 16 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 10\\(2 \) 4\\(2 \) | | | 31/8 " 31/2 | 1778 | 71.2 | 32.25 |
| 8 | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | $10\frac{1}{2} + 4\frac{1}{2}$ | 14.25 | 16 | $3\frac{1}{32}$ " $3\frac{1}{2}$ | 171/8 | 71/3 | 34.40 |

Price per set 280.00 consisting of 16 mandrels each with one set of jaws only.

CHAMPION





Fig. 6345A

| No. | Range Inches | Length of Arbor Inches | Length of Sleeve Inches | Price Each | No | Range Inches | Length of Arbor Inches | Length of Sieeve Inches | Price Each |
|----------------------------|---|---|---|---|-------------------------------|---|---|-------------------------------|--|
| 1 2 3 4 5 6 | 1/2 to 9/6 " 31/2 10 " 3/4 " 7/8 " 1 1 " 13/8 | 51 ₂ 61 ₂ 61 ₂ 61 ₂ 71 ₂ 71 ₂ 91 ₄ | 21/2 23/4 23/4 31/4 31/4 4 | 5.00 5.50 6.00 6.50 7.50 13.50 | 7 8 9 10 11 12 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c} 914 \\ 1116 \\ 141_{2} \\ 17 \\ 20 \\ 24 \end{array}$ | 5 5,16 6 7 8 | 15,50 17,50 26,50 37,50 52,00 68,50 |

All sizes from Nos. 1 to 5, inclusive, have one flexible sleeve only. All sizes from No. 6 upward have two flexible sleeves to obtain maximum expansion.

HANDLE FORGINGS AND TOOL STEEL BALLS

MACHINE HANDLE FORGINGS





Fig. 2679A

BAL

| | | | | rıg. | 2679B | |
|---|-----|-----|---|------|-------|--|
| L | PAT | TER | N | | | |

| Number | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|--------------------------------|--------------|------------------|------|------|------|--------------------|-------|-----|------|
| Length Over Allinches | 2 | $\frac{21/4}{4}$ | 25/8 | 31/4 | 37/8 | 41/2 | 51.8 | 534 | 65 |
| St'nd'rd Length Shank " | 1/2 | 1/2 | 5/8 | 34 | 7/8 | 1 | 11/3 | 114 | 11/2 |
| Maxim'm " " " Diameter Shank " | 11/16 5/6 | 11 | 13 | 11/8 | 114 | 11/2 | 1 1/8 | 11/ | 3/3 |
| Priceeach | .07 | .08 | 10 | 13 | .17 | $\overset{37}{22}$ | .27 | .33 | .40 |

CONE PATTERN

| Number | 11 | 13 | 15 | 16 |
|-------------------------|-------|------------|------|------|
| Length Over Allinches | 33/8 | 41/2 | 51/2 | 6 |
| Standard Length Shank " | 1/2 | 3,1 | 1/8 | 11/6 |
| Maximum " " " | 11/16 | 11/8 | 13% | 11/2 |
| Diameter Shank " | 8/8 | 7∕6 | 1/2 | 1 % |
| Price each | .13 | .22 | .27 | .33 |

HARDENED STEEL BALLS

"STANDARD ALLOY" AND "HIGH DUTY" GRADE. FIRST QUALITY



HIIGH DUT Fig. 2679C

| Diameterinches | 1/6 | 32 | 1/9 | 32 | 3/16 | 37 | 1/4 |
|-----------------|--------|--------|--------|--------|---------|---------|--------|
| Priceper 1000 | 6.00 | 3.50 | 2.00 | 2.50 | 3.00 | 5.00 | 5.00 |
| Diameterinches | 5/6 | 3/8 | 7/6 | 1/2 | % | 5/8 | 11/6 |
| Price per 1000 | 8.00 | 14.00 | 22.00 | 30.CO | 36.00 | 40.CO | 50.00 |
| Diameter inches | 34 | 13/6 | 7/8 | 15/6 | 1 | 11/8 | 11/4 |
| Priceper 1000 | 60.00 | 80.00 | 110.00 | 120.00 | 160.00 | 130.00 | 300.00 |
| Diameterinches | 13/8 | 11/2 | 15% | 13/4 | 17/8 | 2 | |
| Price per 1000 | 400.00 | 400.00 | 800.00 | 800.00 | 1600.00 | 1600.00 | •••• |

We are prepared to furnish any quantity of Steel Balls, of any size required.

TOOL STANDS, HOLDERS, ETC.

ORTABLE TOOL STAND

PORTABLE VISE STAND

STATIONARY BENCH







Fig. 5780A

Fig. 5780B
PORTABLE TOOL STANDS

Fig. 5780C

| Height Inches | Distance Between Shelves Inches | Size Top Shelf Inches | Size Other Shelves Inches | Weight Without Vise Pounds | Price Without Vise Each |
|------------------|---------------------------------------|-----------------------------|---------------------------------|----------------------------------|-------------------------------|
| 40 | 7 | 22 x 30 | 22 x 24 | 300 | 40.00 |

PORTABLE VISE STANDS

| Height | Size of Table | Size of Base | Weight | Price Without |
|--------|-------------------|--------------|--------|---------------|
| Inches | and Shelf, Inches | Inches | Pounds | Vise Each |
| 44 44 | 17 x 21 | 26 | 350 | 34.00 |
| | 21 x 25 | 29 | 575 | 48.00 |

Above prices include drawer and lock.

STATIONARY BENCHES

| nber | Height Inches | Size of Table and Shelf Inches | Weight Pounds | Price Complete Without Vise Each | Price Without Shelf or Drawer Each |
|-----------|------------------|--------------------------------------|------------------|--|--|
| 10 | 36 | 17 x 21 | 200 | 17.50 | |
| £1 | 36 | 17 x 21 | 200 | | 13.00 |
| 50 | 33 | 21 x 25 | 300 | 25.00 | |
| 51 | 33 | 21 x 25 | 300 | | 20.00 |



TOOL HOLDERS

| Size of Tray inches | 14x14 |
|-------------------------|-------|
| Holds Blue Printsinches | 36x36 |
| Standard" Priceeach | 5.00 |

These Tool Holders are just clamped on to side of the bed, a monkey wrench is all that is necessary. No holes to drill and takes but a minute to put on any lathe.

It provides a place for tools, wrenches, oil cans, waste and blue prints where they can always be found and cannot be knocked off on the floor.

STEEL TOOL CHESTS

STYLE A







| FI | g. | 57 | 28A | |
|----|----|----|-----|--|
| | | | | |

Number.... Length Width.... Depth.... Price, Style

| | | | 1. | 2 | 3 | 4 |
|---|------|----------------|-------|-------|-------|-------|
| | | inches | 24 | 30 | 36 | 42 |
| | | | 12 | 15 | 17 | 20 |
| | | | 11 | 14 | 16 | 19 |
| A | with | One Drawereach | 12.50 | | | |
| A | 4.6 | Two Drawers " | 14.00 | 18.50 | 20.50 | 23.50 |
| В | 44 | One Tray " | 13.00 | 18.50 | 20.50 | 23.00 |
| В | 44 | Two Trays " | 13.50 | 19.00 | 21.00 | 24.00 |

STYLE C



STYLE C



Fig. 5728D

| Number | 1 | 2 | 3 | 4 |
|--------------|-------|-------|-------|-------|
| Lengthinches | 30 | 36 | 42 | 46 |
| Width | 112 | 11 | 11 | 15 |
| Priceeach | 12.50 | 15.00 | 17.00 | 20.00 |

STYLE D

| Number | 1 | 2 | 3 | 4 |
|--------------|-------|-------|-------|-------|
| Lengthinches | 24 | 30 | 36 | 42 |
| Width " | 12 | 15 | 17 | 90 |
| Depth " | 11 | 14 | 16 | 19 |
| Priceeach | 15.50 | 21.00 | 23.00 | 26.00 |

These Chests are made of 1/16-inch Cold Rolled Steel with malleable iron Corners and hard wood Braces and fitted with wrought iron hinges and hasps, brass locks and keys and bolts to screw down cover at front corners.

THE RE

12

10

STARRETT'S STEEL RULES

SPRING TEMPERED RULE

PLEXIBLE RULE

NARROW RULE

| րդ է գրդադրդորդորդորդորդորդորդում 1 | pper repper s bacada slaba | antipolati bitalahin Gundanasi Talah |
|-------------------------------------|-------------------------------|---|
| | Fig. 5637 | _ |

| 12 TOTAL DE 1 | 74.2 | 777° | 2¦ wob |
|-------------------|-------------|------------|-------------|
| dadatedataladatal | اليورانيران | البابوانيا | باستامانيان |
| | Pig. | 563 | 7 R |

| - | Ţ, | Ē | 12.7 | T. | | | | ü | T) | |
|-------|----|---|------|----|----|----|-----|---|----|--|
| | | | Fi | g. | 56 | 37 | r C | | | |

SPRING TEMPERED RULES—Thickness 3-64 Inch or No. 18 Gauge

| Lengthinches | 1 | 2 | 3 | 4 | 6 | 9 | 12 | 18 | 24 | 36 | 48 | |
|--------------|-----|-----------|----------------|-----|-----|------|------|------|------|------|------|--|
| Widthinches | 1/2 | 1/2 | % ₆ | 5/8 | 3/4 | 7/8 | 1 | 11/8 | 11/4 | 11/4 | 11/4 | |
| Price each | .15 | $.25^{2}$ | .35 | .45 | .65 | 1.00 | 1.25 | 2.00 | 2.50 | 5.00 | 7.00 | |

GRADUATION NUMBERS OF SPRING TEMPERED RULES

| Number | 300 | 301 | 302 | *303 | *.304 | 306 | 307 | 308 | 309 |
|-------------------|------|-------|-------|------|-------|------|-----|------|-----|
| Graduation Number | 4 | 1 | 2 | 4 | 4 | 6 | 7 | 15 | 16 |
| Number | †400 | **403 | **404 | †407 | ‡410 | ‡417 | 600 | *603 | |
| Graduation Number | 4 | 4 | 4 | 7 | 4 | 7 | 4 | 4 | |

No. 303 graduated in 32nds of an inch on opposite sides of one end. No. 304 graduated in 32nds on one side and in 48ths on the other side of same end. [*Nos. 303 and 304 made in 2 to 24-inch lengths only. No. 600 in lengths 1 to 24 inches and No. 603, 2 to 24 inches. *No. 603 graduated in 32ds on both ends of one side.

†Have one beveled edge. No. 400 with 64ths on bevel and No. 407 with 100ths.

Made in lengths 1 to 24 inches only.

Length inches

10

Graduation Number

**Have one beveled edge graduated in 64ths. No. 403 has one end graduated in 32nds on opposite sides of one end and No. 404 in 32nds on one side and 48ths on other side of same end. Made in lengths 2 to 24 inches only.

These are heavy rules about 1/10-inch in thickness. Made in lengths 6 to 48 inches

only.

FLEXIBLE AND SEMI-FLEXIBLE RULES

| Lengthinches | 1 | 2 | 3 | 4 | 6 | 9 | 12 | 18 | 24 | _36 | 48 |
|--------------|-----|-----|-----------|-----------------|-----|------|------|------|------|------|------|
| Widthinches | 1/2 | 1/2 | 1/2 25 | 16 | 1/2 | 1/2 | 1/2 | 3/4 | 34 | 34 | 7 40 |
| Priceeach | .15 | .25 | .35 | $\frac{72}{45}$ | .65 | 1.00 | 1.25 | 2.00 | 2.50 | 5.00 | 1.00 |

NARROW RULES

*Semi-Flexible Rules about $\frac{1}{10}$ -inch thick, and graduated in 32nds on both sides of one end. Made in 2 to 12-inch lengths only.

About 13-inch wide. No. 18 Gauge, Spring Tempered

| Tite | eac | n | . 40 | <u> </u> | .00 | 1 | | | | | | |
|--------------------|-----|-----|------|----------|-----|------|-----|-----|-----|--|--|--|
| GRADUATION NUMBERS | | | | | | | | | | | | |
| Number | 320 | 391 | 392 | 393 | 394 | *325 | 330 | 331 | 332 | | | |

GRADUATIONS OF STEEL RULES IN PARTS OF INCHES

| Number of Graduat First Corner Second " Third " Fourth " | _ | 1 10, 20, 50, 100 12, 24, 48 16, 32, 6 14, 29 | 3 1 4 1 | 2 20, 50, 100 12, 24, 48 16, 32, 64 8 | 4 64 32 16 8 | 6 32 48 50 64 | 7 64 32 16 100 |
|--|--------------|---|----------------|---|--------------------------|---------------------------|----------------------------|
| Number of Grad. | 10 | | 12 | 13 | 14 | 15 | 16 |
| First Corner Second " Third " Fourth " | 32 64 | 64 100 | 50 100 | 8 16 | . 32 | 10 20 50 100 | 32 64 50 100 |

STARRETT'S HOOK RULES

IMPROVED

NARROW

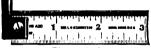




Fig. 5639A

Fig. 5639B

IMPROVED HOOK RULES

| Lengthinches | 6 | 9 | 12 . | 18 | 24 | 36 |
|--------------|------|------|------|------|------|--------------|
| Widthinches | 34 | 7/8 | 1 | 11/8 | 11/4 | 11/4 |
| Price each | 1.00 | 1.40 | 1.75 | 2.50 | 3.00 | 5. 75 |

NARROW HOOK RULES, No. 422

| Lengthinches | 4 | 6 | 9 | 12 |
|-------------------------|-------------|-----|--------------------------------------|------|
| Width inches Price each | 3/16 .70 | .90 | ⁸ / ₁₆ 1.25 | 1.50 |

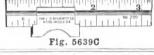
GRADUATION NUMBERS OF HOOK RULES

| Number | 419 | 420 | 421 | 422 |
|-------------------|-----|-----|-----|-------------|
| Rule Numbers | 303 | 300 | 410 | 330,331,332 |
| Graduation Number | 4 | 4 | 4 | 10,11and12 |

No. 419 graduated on one end.

No. 422 graduated on one side in 32ds and the other 64ths of an inch. SLIDE CALIPER RULE

RULE WITH THUMB SLIDE





| Number | 290 | 291 | 292 | *296 | 297 |
|-------------------|------|------|------|------|-------|
| Lengthinches | 6 | 6 | 6 | 4 | 6 |
| Width " | 9/16 | 9/6 | 916 | 5/8 | . 9/6 |
| Graduation Number | 4 | 1 | 2 | 4 | 7 |
| Price each | 1.00 | 1.00 | 1.00 | 1.25 | 1.00 |

*Slide Caliper Rule graduated with 32ds and 64ths on one side, and 8ths and 16ths on the other side; $\frac{1}{16}$ -inch thick, $1\frac{1}{16}$ -inch wide.

BLACKSMITHS' STEEL RULE

BLACKSMITHS' HOOK AND HANDLE RULE



6 7 8 6 18 0 12 O Fig. 5639F

Fig. 5639E

BLACKSMITHS' STEEL RULES

| Number | 460 | 461 | 462 |
|--------------------|------------|-----|-----|
| Lengthinches | 24 | 24 | 24 |
| Width " | 3/4 | 3/4 | 34 |
| Length of Joints " | $1\hat{2}$ | 12 | 12 |
| Price each | .50 | .75 | .75 |

Graduated in 8ths on one side and 16ths of an inch on the other side. No. 461 has stop joint. No. 462 made of hard brass.

BLACKSMITHS' HOOK AND HANDLE RULES, No. 465

Price, Length Over All 1634 inches.....each 1.15

Graduated 12 inches, have flat handle. Made of hard rolled sheet brass 1/10-inch thick, 11k inches wide.



STARRETT'S STEEL RULES

FOLDING POCKET

NEW DESK RULE No. 367





Fig. 5638A FOLDING STEEL POCKET RULES, No. 450

| 1025114 5122 100121 110225, 110. 400 | | |
|--------------------------------------|-----|-----|
| Lengthinches | 12 | 24 |
| Widthinches | 3/8 | 3/8 |
| Length Joints " | 4 | 6 |
| Number of Folds | 3 | 4 |
| Price each | .25 | .40 |
| " in Metal Bound Leather Cases" " | .30 | .50 |
| " Nickel Plated, extra " | .10 | .15 |
| NEW DESK RULES, No. 367 | | |
| | | |

| Lengthinches | 8 | 9 | 12 |
|--------------|-----|-----|-----|
| Widthinches | 1 | 1 | 1 |
| Priceeach | .50 | .60 | .75 |

Beveled and graduated in 16ths of an inch.

SPRING STEEL DESK RULE







Fig. 5638C SPRING STEEL DESK RUIFS

| Lengthinches | | | 18 |
|----------------------------------|-----|------|------|
| Price, No. 365 not graduatedeach | .50 | .75 | 1.00 |
| " " 366 graduated one edge " | .75 | 1.10 | 1.40 |

DRAFTSMEN'S SCALES

| Number | 40 | 5 | 40 | 5A |
|--------------|------|------|------|------|
| Lengthinches | 6 | 12 | 6 | 12 |
| Priceeach | 1.00 | 1.50 | 1.00 | 1.50 |

GRADUATION NUMBERS OF DRAFTSMENS' SCALES

| Number | 405 | 405 A |
|--------------------|--------------------|-----------------------|
| Graduation Numbers | 10, 40, 50, 100ths | 8, 16ths, 32ds, 64ths |

DRAFTSMENS' STEEL STRAIGHT EDGES PLAIN BEVELEI





Fig. 5638E Fig. 5638F 60 72 Length.....inches 12 15 18 30 36 42 48 54 1¾ $1\frac{1}{2}$ 2.502 2 2 21/2 Widthinches 13/4 $3\frac{3}{32}$ 3.255.006.50Price, No. 381 Plain each 4.25 1.25 1.75 2.00 2.25 3.00 3.75 4.75 6.00 7.50 8.50 10.50 No. 386 Beveled "

Above straight edges are nickel plated with dull finish and with a hole at one end.

STARRETT'S STEEL STRAIGHT EDGES

PLAIN







Fig. 5640A

Fig. 5640B

STEEL STRAIGHT EDGES-Not Graduated

| Lengthinches | 12 | 18 | 24 | 36 | 48 | 60 | 72 |
|--|-------------|----------------------------|---------------------------|-------------------------|----------------------------|------------------|------------------|
| Width inches Thickness " Price, No. 380, Plain each " " 385, Beveled " | 3/6 1.20 | 114 3/6 1.80 2.50 | 1½ 3/6 2.40 3.50 | 2 14 5.00 6.00 | 2½ 1,4 8.00 10.00 | 3 14 12.00 | 3 14 16.00 |

GRADUATED STEEL STRAIGHT EDGES

| Lengthinches | 12 | 18 | 24 | 36 | 48 |
|--|------|------|------|------|-------|
| Widthinches | | 11/4 | 11/2 | 2 | 21/2 |
| Thickness " Price, No. 383, Plain each " " 387 Reveled " | 1.80 | 2.50 | 3.25 | 6.25 | 10.00 |
| " " 387, Beveled " | 2.00 | 3.00 | 4.25 | | |

No. 383 Graduated one side only one edge in 16ths, and the other in 8ths of an inch. No. 387 Graduated on beyeled edge only in 32ds of an inch.

STEEL SHRINK RULES

| Lengthinches | 6 | 12 | 24 |
|--------------------|-----|------|------|
| Price each | .75 | 1.75 | 3.50 |
| GRADUATION NUMBERS | | | |

| Number | 370 | 371 | 372 | *373 | 374 | **375 | **376 | †377 | †378 379 | • |
|--------------------|-----|-----|------------|------|-----|-------|-------|------|------------|---|
| Graduation Number | 4 | 2 | 32ds,64ths | 4 | 4 | 4 | 2 | 4 | 2 2 | _ |
| Shrinkinch to foot | 1/8 | 1/8 | 1/8 | 1/8 | 110 | 3/6 | 3/6 | 1,4 | 14 15 | |

*Shrink and Standard Rule. **Brass Shrink Rules. †Double Shrink Rules. All Spring Tempered except No. 372, which is Flexible.

> COMBINATION No. 167

ADJUSTABLE METAL EDGE No. 168





Fig. 5640D Fig. 5640C COMBINATION STRAIGHT EDGES

| Length inches | | 24 | 30 | 36 | 42 | 48 |
|--|--|------------------------------|----------------------|----------------------|----------------------|---------------------|
| Width inches Price, Plain each Graduated in 32ds " | $\frac{1!4}{2.25}$ $\frac{3.00}{3.00}$ | $1\frac{1}{4}$ 2.75 3.50 | 11/4 3.50 4.75 | 13/4 4.25 5.50 | 13/4 5.00 6.75 | 134 5.75 8.00 |

Extra needle points, 30 cents per dozen, extra needle holders 10 cents each. In ordering the latter, mention width of straight edge blade.

ADJUSTABLE METAL EDGES

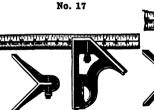
| Lengthinches | 16 | 18 | 19 | 20 | 21 | 23 | 24 | 26 | 27 |
|--------------|------|------|------|------|------|------|------|------|------|
| Priceeach | 1.35 | 1.50 | 1.60 | 1.70 | 1.80 | 1.90 | 2.00 | 2.20 | 2.30 |
| Lengthinches | 99 | 30 | 32 | 24 | 00 | 20 | 40 | 48 | 80 |
| Priceeach | 40 | 1 00 |) i | | | | | | |

These are nickel plated.

STARRETT'S SQUARES

COMBINATION SQUARES

No. 11



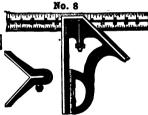


Fig. 5641A

Fig. 5641B

Fig. 5641C

COMBINATION SQUARES, No. 11

| Sizeinches | 4 | 6 | 9 | 12 | 18 | 24 |
|--|-----|--------------|----------------|----------------|----------------|--------------|
| Price without Center Headeach "with "" | .75 | 1.00 1.50 | $1.25 \\ 1.75$ | $1.50 \\ 2.00$ | $2.25 \\ 2.75$ | 2.75 3.25 |

With hardened blades graduated in Nos. 1, 2, 4, 7 and 16 graduations. No. 4 graduation always sent unless otherwise ordered.

COMBINATION SQUARES, No. 23-Same Design as No. 11

| Size | | | | inches | 6 | 9 | 12 |
|-------|---------|--------|------|------------|------|------|------|
| Price | without | Center | Head | each | 1.00 | 1.25 | 1.50 |
| 44 | with | 66 | | . " | 1.50 | 1.75 | 2.00 |

Blade is made of good, hard steel, but not hardened. No. 4 graduation only.

COMBINATION SQUARES, No. 33-8ame Design as No. 11

| Size inches | 6 | 9 | 12 | 18 | 24 |
|---|--------------|--------------|---------------------|--------------|--------------|
| Price, without Center Headeach "with " "" | 2.00 2.50 | 2.25 2.75 | $\frac{2.50}{3.00}$ | 3.25 3.75 | 3.75 4 25 |

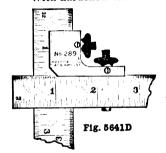
Drop forged with hardened heads and blades. Blades graduated.

Nos. 1, 2, 4, 7, and 16 graduations. No. 4 graduation always sent unless otherwise ordered.

COMBINATION SQUARES, Nos. 17 AND 8

| Number | 1' | 7 | 8 | |
|--------------------------------|---------|---------|--------|-------------|
| Sizeinches | 18 | 24 | 18 | 24 11/ |
| Width of Blade | 1/4 | 1/4 | 1/2 | 172 - J. |
| Thickness of Blade | 37 6 | 37 6 | 81/4 | 81/4 |
| Mitro " | 4 | 4 | 5 | 5 |
| Price, without Center Headeach | 2.75 | 3.25 | 5.00 | 6.00 |
| " with " "" | 3.75 | 4.25 | 1 6.00 | 1.00 |

With hardened blades.



ATTACHMENT FOR COMBINATION SQUARES NO. 289

| _ | | | | | | |
|-----|-----|------|------|------|------|-----|
| D. | iaa | | | | each | .75 |
| ı ı | 100 | | | | | |
| | | | | | | |
| | | | | | | |



STARRETT'S PROTRACTORS, ETC

BEVEL PROTRACTOR No. 12



COMBINATION SET

Fig. 5644A

Fig. 5644B

BEVEL PROTRACTORS. No. 12

| Sizeinches | 9 | 12 | 18 | 24 |
|---|---------------------|--------------|--------------|----|
| Price Completeeach " Protractor Head with Level Attachment" | $\frac{2.75}{2.00}$ | 3.00 2.00 | 3.50 2.00 | |

Blades with No. 4 graduation will be sent unless otherwise ordered. Length of head, 7 inches.

COMBINATION SETS, No. 9

| Size inches | 9 | 12 | 18 | 24 |
|------------------------|------|------|------|------|
| Price, Completeper set | 3.75 | 4.00 | 4.75 | 5.25 |

INCLINOMETER No. 10

PATENT PROTRACTOR No. 16



Fig. 5644C



INCLINOMETERS, No. 10



Fig. 5644D

| Size inches | | 18 | 24 |
|--|------|------|------|
| Price, without Center Headeach " Center Head only" | 4.00 | 5.00 | 6.00 |

Sent without center head unless otherwise ordered.

PATENT PROTRACTORS, No. 16

| Sizeinches | 12 | 18 | 24 |
|----------------------------------|--------------|----|--------------|
| Price, Completeeach "Stock only" | 4.75 3.50 | | 6.00 3.50 |



UNIVERSAL BEVEL PROTRACTORS, No. 360

| Sizeinches | . 7 | 12 |
|--|--------------|--------------|
| Priceeach " in Leather Case" | 6.00 6.75 | 7.00 8.00 |
| Price, with both 7 and 12-inch Blades in Leatherette Case | | 7.50 8.50 |

Fig. 5644E

7-inch in leatherette case sent unless otherwise ordered.

STARRETT'S PROTRACTORS, BEVELS, ETC.





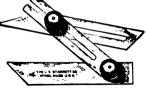


Fig. 5645A

Fig. 5645B

PROTRACTORS, No. 193

COMBINATION BEVELS, No. 49

Price, Length of Stock about 4 inches.....each 2.00

UNIVERSAL BEVEL No. 15

them into Bevel Protractors.

IMPROVED BEVEL No. 47





Fig. 5645C

Fig. 5645D UNIVERSAL BEVELS. No. 15

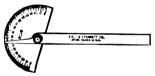
Price, 3-inch....each | 1.50

The set-off in the blade increases its capacity and usefulness for bevel gear work, etc., so that any angle, however slight, may be obtained.

IMPROVED BEVELS. No. 47

| Sizeinches | | | |
|-----------------------------------|------|------|------|
| Length of Stock inches Price each | 31/2 | 43/4 | 6 |
| Price each | 1.25 | 1.50 | 1.75 |

PROTRACTORS No. 19



Pig. 5645E

Price.....each 1.50

Graduated in degrees from 0 to 90, both ways. The blade is 6 inches long.

STARRETT'S STEEL SQUARES

TRY SQUARE

DOUBLE SQUARE

THIN STEEL TRY SQUARE



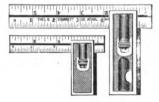




Fig. 5642A

Fig. 5642B

Fig. 5642C

RELIABLE TRY SQUARES, No. 60

| Length of Bladeinches | 4 | 5 | 6 | 9 | 12 |
|--------------------------------|---|---|-----------------------|-------------|-----------|
| Length of Beaminches Priceeach | | | $\frac{35}{8}$ 1.25 | 5½6 2.00 | 6 2.75 |

Graduated blade not hardened.

RELIABLE TRY SQUARES, No. 61

| Length of Bladeinches | 4 | 5 | 6 | 9 | 12 | 18 | 24 |
|-------------------------------------|--------------|-----------|--------------|------|-----------|----|----|
| Length of Beam inches Price each | 25/6 1 25 | 3 1.50 | 35/8 1.75 | 51/6 | 6 3 00 | 9 | 12 |

Blade with hardened edge, not graduated.

DOUBLE SQUARES, No. 13

| Sizeinches | *4 | *6 | 9 | 12 |
|----------------------|------|------|------|------|
| Priceeach | 1.25 | 2.00 | 3.00 | 4.00 |
| " with both Blades " | 1.65 | 2.50 | | |

*These are always sent with bevel blade and graduated blade unless otherwise ordered. With hardened blades graduated in Nos. 1, 2, 4, 7, and 16 graduations. No. 4 graduation sent unless otherwise ordered.

There is a level in the stocks of the 6, 9, and 12 inch squares.

DOUBLE SQUARES, No. 13G

| Lengthinches | 4 | 6 | 9 | 12 |
|-----------------------|------|------|------|------|
| Priceeach | 1.50 | 2.35 | 3.50 | 4.50 |
| " with both Blades" " | 1.90 | 2.85 | | |

The same as No. 13, except that one side of the stock is grooved, making the tool convenient for use on round work, without impairing its value for ordinary purposes.

THIN TRY SQUARES, No. 21

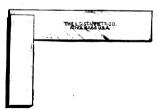
| Sizeinches | 2 x 1 | 3 x 2 | 4 x 3 | 6 x 4 | 8 x 6 | 10 x 8 | 12 x 8 |
|------------------------------|---------------------------|-------------------------------|---------------------------------|-------|-------|--------|--------|
| Thicknessinches Priceeach | 1.00 | | | 3.00 | 4.00 | 5.00 | 6.00 |
| Graduationsin. | 16ths and 6- 32ds " 6- | 4ths one side 4ths other " | le 16ths and 32ds on both sides | | | | |

Any of the above squares can be furnished in metric measure if so desired.

STARRETT'S STEEL AND CENTER SQUARES

HARDENED EDGE, SOLID STEEL SQUARE

HARDENED, GRADUATED No. 63





Pig. 5643A Pig. 5643B HARDENED EDGE SOLID STEEL SQUARES, No. 20

 Blade inside Beam...inches
 1
 1½
 2
 3
 4½
 6
 9
 12
 15
 18
 24

 Price.....each
 1.50
 1.75
 2.00
 2.50
 3.50
 4.50
 6.50
 9.00
 15.00
 18.00
 25.00

HARDENED GRADUATED STEEL SQUARES, No. 63

| Sizeinc | hes | 2 | 3 | 4 | 6 | 9 | 12 |
|---------|-----|------|------|------|------|------|------|
| Priceer | ach | 1.50 | 2.00 | 2.50 | 3.50 | 5.50 | 6.50 |

Graduated in 32ds on one side and 64ths on the other.

DOUBLE STEEL SQUARES HARDENED STEEL, No. 14

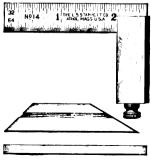


Fig. 5643C

| Number | 14A | 14B | 14C |
|---------------------------------------|------|------|------|
| Price, Squareeach | 2.00 | | · |
| " with either Bevel or Narrow Blade " | | 2.30 | |
| " Complete " | | | 2.60 |

Sent complete unless otherwise specified.

CENTER SQUARES, No. 32



| Length of Blade | .inches | 12 | 18 | 24 |
|-----------------|---------|------|------|------|
| Price | each | 2.00 | 2.75 | 3.25 |

Price Center head alone 1.00.

STARRETT'S CALIPER SQUARES







Fig. 6694A Pig. 6694B CALIPER SQUARES, No. 426

| Style | A | В | C | D | £ | F |
|--------------------------------|------|------|------|------|------|------|
| Lengthinches | 3 | 4 | 6 | 3 | 4 | 6 |
| Price with Adjusting Screweach | 3.75 | 4.50 | 7.50 | | | |
| " without Adjusting Screw " | | | | 3.00 | 3.50 | 5.50 |
| " with Hardened Jawsextra | | | 1.50 | 1.50 | 1.50 | 1.50 |
| " Leatherette Case " | .75 | .75 | .75 | .75 | .75 | . 75 |

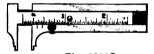
Sent with Adjusting Screw and without case unless otherwise ordered.

MICROMETER CALIPER SQUARES, No. 28

| Sizeinches | 4 | 6 | 9 | 12 |
|-------------------------------------|------|-------|-------|-------|
| Price with Case each without Case " | 8.75 | 11.00 | 15.25 | 19.50 |
| " without Case " | 8.00 | 10.00 | 14.00 | 18.00 |

Sent with case unless otherwise ordered.

POCKET SLIDE CALIPER Nos. 425 and 425A SLIDE RULE CALIPER AND CIRCUMFERENCE GAUGE No. 424





POCKET SLIDE CALIPERS

Fig. 6694D

| Sizeinches | | |
|---|--------------|--------------|
| Price, No. 425, Graduated in 32ds and 64thseach " 425A, Graduated in 32ds on Stock and 100ths on Slide" | 2.00 2.00 | 3.00 3.00 |

SLIDE RULE CALIPER AND CIRCUMFERENCE GAUGES, No. 424

| Sizeinches | |
|---|------|
| Price, Graduated in 32ds Standard and 16ths Circumference Measureeach | 3.50 |

CALIPER SQUARE, No. 25



Fig. 6694E CALIPER SQUARES, No. 25

| Sizeinches | | 4 | 6 |
|--|--------------|--------------|--------------|
| Price, without Adjustable Screweach " with " " "" | 3.00 3.50 | 3.50 4.00 | 5.00 5,50 |
| Price, with Hardened Jaws, extra " in Leatherette Case " | | .each | 1.50 .75 |

Graduated in 64ths on one side, 100ths on the other.

STARRETT'S SQUARES

T SQUARES

IMPROVED T SQUARE No. 164 DRAFTSMEN'S T SQUARES
No. 163 No. 171



Fig. 6692A

Fig. 6692B

Fig. 6692C

IMPROVED T SQUARES, No. 164

| Length of Bladeinches | 22 | 26 | 32 | 36 | 42 | 48 |
|------------------------------|-------------------------|-------------------|------------|---|-------------------|------|
| Width of Bladeinches Head | $\frac{11\sqrt{4}}{10}$ | $\frac{1!_4}{10}$ | 11/4 10 | $\begin{array}{c} 1\frac{3}{4} \\ 13 \end{array}$ | $\frac{13/4}{13}$ | 13/4 |
| Price not Graduatedeach | 3.50 4.25 | | | | 6.50 8.00 | |

IMPROVED T SQUARES, No. 164M

| Length of Bladeinches | 22 |
|--------------------------|------|
| Price 60 CMeach " 80 " " | 4.50 |
| " 1 Meter " | 8.00 |

The same as No. 164 except that the blades are graduated in millimeters.

DRAFTSMEN'S T SQUARES, No. 163

| Length of Blade | | | | 26 | 48 , |
|-----------------------------|------|------|------|------|------|
| Width of Blade Thickness | 46 | 3 | 3 | 11/4 | 11/4 |
| Price | each | 3.00 | 3.50 | 5.00 | 6.50 |

DRAFTSMEN'S T SQUARES, No. 171

| Length of Bladeinches | 14 | 16 | 18 |
|------------------------|------|------|------|
| Headinches | 8 | 8 | 8 |
| Head inches Price each | 1.25 | 1.50 | 1.75 |



Fig. 6692D

DRAFTSMEN'S PROTRACTORS, No. 361

| Number | 361A | 361B |
|---------------------|------|------|
| Priceeach | 6.50 | |
| " in Leather Case " | | 7.75 |

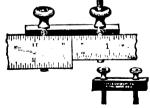
This Protractor is made of sheet steel, nickel plated, graduated in degrees and figured to read from either right or left, with vernier to read in five minutes. The three straight edges of the Protractor are graduated in inches and 16ths, the longer part 6 inches.

STARRETT'S KEY-SEAT CLAMPS, ETC.

KEY-SEAT CLAMP

RULE CLAMP No. 299





Pig. 6693A

Fig. 6693B

KEY-SEAT CLAMPS, No. 298

| Priceper ¡ | pair | .60 |
|--|-----------|-----|
| Those less seat wiles are designed to transform any common steel see | la inta d | . 1 |

These key-seat rules are designed to transform any common steel scale into a key-seat rule. A pair weighs but 1 ounce, they can be put on or off almost instantly, and are a complete substitute for a more costly tool.

RULE CLAMPS, No. 299

rule. The rules may be the same or different widths up to $1\frac{1}{4}$ inch. This clamp will be of special value to mechanics, whose tool chests will usually not hold rules longer than 12 inch.

PATENT KEY-SEAT RULE No. 105







Fig. 6693C

Fig. 6693D

PATENT KEY-SEAT RULES, No. 105

| | | | | · · · · · · · · · · · · · · · · · · · | | |
|--------------|------|-------|-------|---------------------------------------|-------|-------|
| Number | 105A | *105B | †105C | 105D | *105E | †105F |
| Lengthinches | 6 | 6 | 6 | 9 | 9 | 9 |
| Priceeach | 2.25 | 2.75 | 3.00 | 3.00 | 3.75 | 4.25 |

*With auxiliary straight edge plain. †With auxiliary straight edge graduated. Where the style is not designated in order, No. 105A will be sent.

SECTION LINER AND PROTRACTOR, Nos. 165 AND 1651/2

| Price | Section | Liner | 15-i | inch | 1. | | | | | | | | | | | | 6 | eacl | h | 5.00 |
|-------|---------|-------|------|------|----|------|------|------|------|------|------|------|--|------|------|------|-------|------|---|------|
| 66 | 44 | 46 | 24 | 44 | | | | | | | | | | | | | | 4.6 | | 6.00 |
| 64 | 6.6 | 66 | 36 | | | | | | | | | | | | | | | | 1 | 7.0 |
| 4.6 | Protrac | tor. | | | | | | | | | | | | | | | | 66 | | 5.0 |

The lower cut shows the section liner with protractor attached, as applied to straight edges.

When ordering section liner alone, the width should be given of the T square blade or straight edge which the liner is to fit. The protractor is ¼ of a 14-inch circle and is graduated as fine as quarter degrees. This, by steady pins, accurately fits, either side up, the jointed arm of the section liner.

STARRETT'S MICROMETERS

ONE-INCH







Fig. 5646A Pig. 5646B WITH LOCKNUT AND RATCHET STOP

| No. | 232 | for | measurements | by | thouse | andths | up | to | 1/0- | inch. | Shor | t. A | nvi | 1 | Easi | each | 5.0 |
|-----|------|-----|-------------------|------|--------|--------|------|----|------|-------|-------|-------|--------|--------|-------|------|-----|
| 44 | 233 | 46 | " | 66 | ten | 46 | " | " | 1% | 66 | | | | | | 66 | 6.0 |
| 46 | 215 | 46 | 46 | 44 | | " | 64 | 66 | 1/ | 66 | | | | | | 66 | 5. |
| 66 | 219 | 40 | 44 | 44 | ten | 64 | 61 | 66 | 1/2 | 66 | | | | | | 66 | 6. |
| | 230 | | ** | 45 | | 46 | " | " | 1 | " | Shor | | | | | 14 | 6. |
| | 231 | | ** | | ten | 44 | 66 | " | 1 | 66 | 44 | | 44 | | | 66 | 7. |
| 6 | 3 | 66 | 44 | 44 | | 66 | 44 | 66 | 1 | 66 | | | | | | 66 | 6. |
| | 113 | 66 | 41 | 4. | ten | 66 | 66 | ** | 1 | 66 | | | | | | 46 | 7. |
| 6 | 2 | 66 | *6 | 66 | | 44 | fro | m | 1 to | 2 in | ches, | and 1 | l-ineh | Test G | 91100 | 46 | 6. |
| 6 | 213 | 66 | 16 | 66 | ten | 44 | | 66 | 7 6 | 9 | 66 | 66 | 66 | 66 | 46 | 66 | 7. |
| ea | ther | Ca | ses for 1/2 and 1 | l-in | ch Mie | cromet | ers. | | | | | | | | | 44 | |
| 6 | | 61 | " 2-inch | Mie | cromet | ers | | | | | | | | | | 66 | |

WITH RATCHET STOP, NO LOCKNUT

| No. | 216 | for | measurements | by | thous | andths | up | to | 1/2 | inch | | | | | | | | | .e | ach | 4. |
|-----|------|-----|-------------------|------|-------|--------|------|----|-----|------|-----|----|--|-----|----|---|----|------|--------|-----|----|
| " | 218 | 44 | 66 | 66 | ten | 44 | 66 | 66 | 1/2 | 46 | | | | | | | | | | 66 | 5. |
| | 202 | 66 | 46 | 46 | | 44 | 44 | 66 | 1 | " | • • | | | • | | • | | ٠. | , | 46 | 5. |
| 6 | 208 | 44 | 44 | 44 | ten | 66 | 44 | 66 | 1 | 66 | • • | ٠. | | • • | ٠. | • | ٠. | ٠. | | | 6. |
| ea | ther | Ca | ses for 1/2 and 1 | 1-in | ch Mi | cromet | ers. | | | | • • | | | • • | | | | | , | 46 | 0. |

WITH LOCKNUT, NO RATCHET STOP

| No. | 201 | for | measur | rements | by | thous | sandth | sup | to | 1-i | inc | h | | | | | | | each | 5.50 |
|-----|------|-----|---------|---------|-----|-------|--------|-----|----|-----|-----|-----|-----|-----|------|--------|-----|--------|------|------|
| | 207 | | | 44 | 44 | ten | 66 | 66 | 44 | 1 | 66 | | | | | | | | 44 | 6.50 |
| | 217 | | | 4 | 66 | | 44 | fro | m | 1 | to | 2 i | nel | es. | and | 1-inel | Tes | t Gans | re " | 6.00 |
| | 214 | | | | | ten | | 4 | 4 | 1 | 46 | 2 | 66 | | . 66 | 66 | 66 | 66 | - 66 | 7.00 |
| Lea | ther | Cas | ses for | 1-inch | Mic | rome | ters | | | | | | | | | | | | 66 | .50 |
| | • | 44 | ** | 2-inch | | 66 | | | | | | | | | | | | | 66 | . 75 |

WITHOUT LOCKNUT AND RATCHET STOP

| No. 203 for measurements by the | usandths | up | to | 1-incl | 1 | | each | 5.00 |
|---------------------------------|----------|-----|----|--------|---|------|------|------|
| " 209 " " ten | | 6.6 | 66 | 1 66 | | | 64 | 6.00 |
| Leather Cases for above Microm | eters | | | | | | " | .50 |

QUICK ADJUSTING Nos. 204 and 205







Fig. 5646C Fig. 5646D WITH LOCKNUT AND RATCHET STOP

| No. | 204 | for meas | urements | by thou | sandths | up | to 1- | incl | h | | each | 10.00 |
|------|-----|----------|-----------|------------------|---------|----|-------|------|---|------|-----------|-------|
| " | 205 | " | 66 | " ten | 46 | " | " 1 | " | | | " | 11.00 |
| •6 | 220 | " | " | 46 | 46 | " | " 1 | " | | | | 6 75 |
| 4 | 221 | 44 | " | ** | 1.6 | 46 | " 16 | " | | | | 5.75 |
| Leat | her | Cases fo | r above M | Iic ro me | ters | | | | | | • • • | .50 |

STARRETT'S MICROMETERS

DROP FORGED

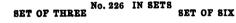








Fig. 5648A

Pig. 5648B

Pig. 5648C

DROP FORGED, No. 226

| Sizeinches | *1 | 2 | 3 | 4 | 5 | 6 |
|---|--------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Capacityinches Price without Ratchet.each " with Ratchet" | 5.50 6.00 | 1 to 2 4.50 5.00 | 2 to 3 6.00 6.50 | 3 to 4 6.50 7.00 | 4 to 5 7.25 7.75 | 5 to 6 8.00 8.50 |

* With decimal equivalents stamped on frame.

No. 226 IN SETS

| In Sets of | 3 | 6 |
|------------------------------------|---------|--------|
| Size Micrometersinches | 1, 2, 3 | 1 to 6 |
| Price, without Ratchet Stopper set | 15.50 | 36.00 |
| " with Ratchet Stop " | 17.00 | 39.00 |
| " Morocco Case, extraeach | 2.00 | 4.00 |

Cases are covered with Morocco leather and lined with velvet.

ATTACHMENT FOR TWO-INCH MICROMETER No. 212

MICROMETER STAND No. 206





Fig. 5648E

ATTACHMENTS FOR TWO-INCH MICROMETERS, No. 212

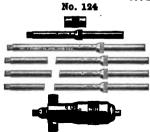
This attachment instantly converts a 2-inch micrometer into a 1-inch tool.

MICROMETER STANDS, No. 206

Stands are nicely finished and nickel plated.

STARRETT'S MICROMETERS

INSIDE MICROMETERS



No. 120 Set A



Fig. 5647A

Fig. 5647B

INSIDE MICROMETERS. No. 124

| Set | Α- | 6 | Rods | and | one | ½-i | nch | gauge, | will | measure | 2 to | 8 | inc | hes. | | per set | 4.50 |
|-----|-----|-----|--------|-------|------|-----|-------|---------|------|------------|--------|-----|-----|--------|-------------------|---------|-------|
| " | B-1 | 10 | 44 | 44 | " | 1/2 | " | " | | ** | 2 | " | 12 | 66 | | - 46 | 5.50 |
| " | C- | 4 | 44 | " | ** | ĺ | " 8 | two 2 | inch | gauges, v | vill n | aea | sur | e 8 te | $532\mathrm{ins}$ | | 6.50 |
| " | D٠ | coi | mprise | es se | ts A | and | l C a | and wil | l me | asure 2 to | 32 | in | che | s | | " | 11.00 |

IN CASES

| Set | A | В | \mathbf{C} | D |
|--------------|---|------|--------------|-------|
| Priceper set | | 6.50 | 8.00 | 12.50 |

INSIDE MICROMETERS, No. 120

| Set | | В | C | D |
|--|--------|---------|---------|---------|
| Number of Rods. Will measureinches | 4 | 7 | 4 | 8 |
| Will measureinches | 2 to 8 | 2 to 12 | 8 to 32 | 2 to 32 |
| Price, without Case per set | 4.00 | 5.00 | 5.75 | 9.75 |
| Price, without Caseper set "with Case" | 4.75 | 6.00 | 7.25 | 11.25 |

Sent with case unless otherwise ordered. Handles .50 extra. Extra Rods .05 per inch. MICROMETER CALIPER GAUGE

No. 126

ADJUSTABLE CALIPER GAUGE No. 125





Fig. 5647C

Fig. 5647D

MICROMETER CALIPER GAUGES, No. 126

| Price, capacity 2½ to 10 inches with 5 Rodsper set | 2.00 |
|--|------|
| " In Leatherette Case " | 2.75 |

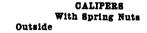
Always sent without case unless otherwise ordered.

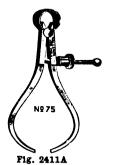
ADJUSTABLE CALIPER GAUGES, No. 125

| Price, capa | city f | rom | 21/2 | to | 63/4 | inches | with | 3 | Rods | per set | 1.00 |
|-------------|--------|-----|------|----|------|--------|------|---|------|---------|------|
| | 65 | " | 6 | " | 16 | 44 | 46 | 3 | " | | 1.25 |

STARRETT'S CALIPERS AND DIVIDERS

FAY PATENT







DIVIDERS With Spring Nuts



FAY PATENT OUTSIDE AND INSIDE CALIPERS

| Sizeinches | 21/2 | 3 | 4 | 5 | 6 | 8 |
|-----------------------------------|------|------|------|------|--------------|------|
| Price, Solid Nutcach "Spring Nut" | 1.00 | 1.00 | 1.10 | 1.10 | 1.35 1.50 | 1.60 |

FAY PATENT DIVIDERS

| Sizeinches | 21/2 | 3 | 4 | 5 | 6 | 8 |
|-----------------------------------|--------------|--------------|------|--------------|--------------|--------------|
| Price, Solid Nuteach "Spring Nut" | 1.00 1.15 | 1.00 1.15 | 1.25 | 1.25 1.40 | 1.60 1.75 | 1.85 2.00 |

CALIPERS

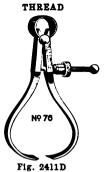




Fig. 2411E

| Sizeinches | 3 | 4 | 5 |
|--|------|------|------|
| No. 76 Solid Nuteach | 1.00 | 1.10 | 1.10 |
| No. 76 Spring Nut. " No. 78 Solid Nut. " | 1.15 | 1.25 | 1.25 |
| No. 78 Solid Nut " | | 1.10 | 1.10 |

STARRETT'S CALIPERS AND DIVIDERS

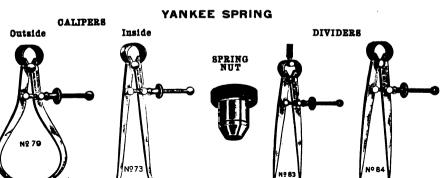


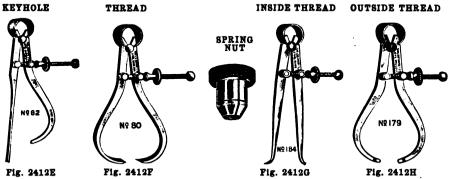
Fig. 2412A Fig. 2412B Fig. 24120 Fig. 241 YANKEE SPRING OUTSIDE AND INSIDE CALIPERS

| Sizeinches | 21/2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
|-------------------------------|------------|------------|------------|------------|-------------|---|--------------|----|
| Price, Solid Nuteach Spring " | .65 .80 | .70 .85 | .75 .90 | .80 .95 | .85 1.00 | | 1.35 1.50 | |

YANKEE SPRING DIVIDERS

| Sizeinches | 21/2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
|--------------------------------|--------------------|------------|------------|------------|---|--------------|--------------|----|
| Price, Solid Nuteach "Spring"" | . 65 .80 | .70 .85 | .75 .90 | .80 .95 | | 1.10 1.25 | 1.35 1.50 | |

CALIPERS



| Size inch | es 3 | 4 | 5 | 6 |
|----------------------|------------|-----|------------|-------------|
| No. 82, Solid Nuteac | ch .70 | .75 | | |
| No. 82, Spring " | " .85 | .90 | . . | . . |
| No. 80, Solid " | " .70 | .75 | .80 | |
| No. 80, Spring " | " .85 | .90 | .95 | . |
| No. 184, Solid, " ' | " [| .75 | .80 | .85 |
| No. 184, Spring, " | " | .90 | .95 | 1.00 |
| No. 179, Solid, " | " [| .75 | .80 | .85 |
| No. 179, Spring, " | " | .90 | .95 | 1.00 |

STARRETT'S CALIPERS

FIRM JOINT







Inside





Fig. 2413A

Nos. 26 AND 27 FIRM JOINT CALIPERS

| Sizeinches | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
|------------|------|------|------|------|------|------|------|
| Price each | .40 | .50 | .55 | .65 | .80 | .90 | 1.00 |
| Sizeinches | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
| Price each | 1.50 | 1.75 | 2.10 | 2.50 | 3.00 | 5.00 | 6.00 |

No. 27. Inside Calipers not made longer than 24 inches.

Nos. 34 AND 35 FIRM JOINT SCREW ADJUSTING CALIPERS

| Sizeinches | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 30 | 36 |
|------------|-----|------|------|------|------|------|------|------|------|------|------|------|
| Priceeach | .90 | 1.00 | 1.25 | 1.50 | 1.75 | 2.00 | 2.25 | 2.50 | 2.75 | 3.50 | 6.00 | 7.00 |

No. 35. Inside Calipers not made longer than 24 inches. Inside

LOCK-JOINT

Outside





LOCK-JOINT TRANSFER



Fig. 2413E

Fig. 2413G

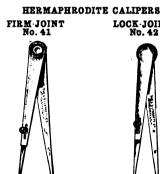
| Sizeinches | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
|------------|-----|-----|------|------|------|------|------|------|------|------|------|
| Priceeach | .90 | .95 | 1.00 | 1.25 | 1,50 | 1.75 | 2.00 | 2.25 | 2.50 | 2.75 | 3,50 |

LOCK-JOINT

LOCK-JOINT TRANSFER

| Sizeinches | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
|------------|------|------|------|------|------|------|------|------|------|------|------|
| Priceeach | 1.25 | 1.40 | 1.50 | 1.75 | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.50 | 4.25 |

STARRETT'S CALIPERS AND DIVIDERS









DIVIDERS



Pig. 5649 A

Fig. 5649B

Fig. 5649D

FIRM-JOINT HERMAPHRODITE CALIPERS

| Sizeinches | 3 | 4 | 5 | 6 | 8 | 10 | 12 |
|------------------------|---|------------|---|------------|-------------|-------------|------|
| Price, No. 41each "241 | | .65 .50 | | .80 .65 | 1.00 .80 | 1.20 .90 | 1.00 |

No. 241 is the same as No. 41 except that both points are solid instead of adjustable.

LOCK-JOINT HERMAPHRODITE CALIPERS

| Sizeinches | 4 | 6 | 8 | 10 |
|--------------------|------|--------------|--------------|--------------|
| Price, No. 42 each | 1.00 | 1.15 1.00 | 1.35 1.25 | 1.60 1.50 |

No. 242 is the same as No. 42 except that both points are solid instead of adjustable.

DIVIDERS

| Sizeinches | 6 | 7 | 8 | 9 | 10 |
|--|---------------------|-----|----------------------|--------------|------|
| Price, No. 43 each " " 92 Plain " " " 92 Nickled " | 1.00 .85 1.10 | .90 | 1.25 1.00 1.25 | 1.15 1.40 | 1.50 |

DOUBLE CALIPER No. 44

DOUBLE CALIPERS No. 44

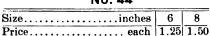
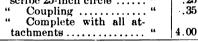
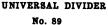




Fig.5649E

| 1100 1 Outl 1 | 1 |
|-----------------------------|------|
| UNIVERSAL DIVIDERS, No | . 89 |
| Price, with 4-inch beam and | |
| V center pointeach | 1.75 |
| " Extra Steel Points " | .10 |
| " Needle Points" | .15 |
| " Pen Attachment" | 1.00 |
| " Extra Straight Point | |
| and Socket" | .50 |
| " Extra 13-inch Beam to | |
| cariba 95 inab airala " | 95 |





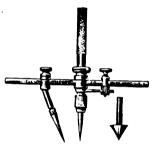


Fig. 5649F

STARRETT'S DIVIDERS, CALIPERS, ETC.

NO. 85 EXTENSION DIVIDERS

No. 90

BALL POINTS







Fig. 5650A

Fig. 5650B

Fig. 5650C

IMPROVED EXTENSION DIVIDERS, No. 85

| Sizeinches | 7 | 8 |
|--|------|------|
| Will scribe Circleinches | 22 | 30 |
| " Caliper Outside " | 11 | 14 |
| " "Inside " | 13 | 16 |
| Price, Completeeach | 2.25 | 2.50 |
| Price, Completeeach "with Divider Legs only" | 1.25 | 1.50 |

IMPROVED BRONZE DIVIDERS, No. 90

| No. 90A, with short Points onlyeach | 2.25 |
|-------------------------------------|------|
| No. 90B, Complete " | 4.00 |

BALL POINTS, No. 88

| Price, Complete with 4 Balls and Holdereach | 1.25 |
|---|------|
| " either Ball or Holder " | .25 |

This attachment consists of four balls of 1% inch, 1-inch, 3/-inch, and 1/2-inch diameter respectively, and a holder which fits either divider leg or trammel head. It is used to form a seat for the divider leg in describing circles around a hole. In ordering this set for use with trammels, please give tool number of the trammel, so that the proper holder may be sent.

BLACKSMITH'S CALIPER No. 173

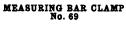






Fig. 5650D

Fig. 5650E

2.00

BLACKSMITHS' FIRM DOUBLE-JOINT CALIPERS, No. 173

Price, length 22 inches over alleach

These calipers comprise a 6-inch and 12-inch caliper.

MEASURING BAR CLAMPS, No. 69

| Price, Nickel Plated | each .50 | |
|----------------------|----------|--|

These clamps are one inch square inside and are to be used with two wooden bars about $1 \times \frac{1}{2}$ inches, of any desired length.



STARRETT'S TRAMMELS AND TRAMMEL POINTS

EXTENSION BEAM TRAMMELS No. 51 No. 58 NEW TRAMMEL



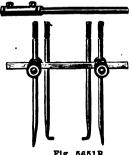




Fig. 5651A

Fig. 5651B

Fig. 5651C

EXTENSION WOOD BEAM TRAMMELS, No. 51

| No. 51A, Complete, Nickel Platedeach | 3 25 |
|--|--------|
| Trois de la completa del la completa del la completa de la complet | |
| No. 51B, Without Caliper Legs " | 2.50 |
| 110. 01D, William Cumper Bogs. | 1 2.00 |
| | |

One of the caliper legs is provided with a joint, worked by an eccentric thumb piece for fine adjustments.

Sent complete unless otherwise ordered.

EXTENSION STEEL BEAM TRAMMELS, No. 58

| Number | 58A | 58B | 58C | 58D | 58E | 58F |
|--------------------------|-----|---------|-----|------|------|------|
| Sizeinches | 14 | 28 | 42 | | | |
| Number of Sections | 1 | 2 | 3 | | | |
| Price, Plaineach | | | | | | |
| " Nickel Plated " | | | | 2.50 | 3.00 | 3.50 |
| " Extra Sectionsper pair | | .40 | .40 | .50 | .50 | .50 |
| " Caliper Points" | .50 | .50 | .50 | .60 | .60 | .60 |

Those not Nickel Plated will be sent unless otherwise ordered.

NEW TRAMMELS, No. 59

| No. 59A. Trammel Heads with 1 pair of points | each | 2.00 |
|--|----------|------|
| " 59B, Balls and Holder | .per set | 1.25 |
| " 59C, Small Caliper Legs | per pair | .50 |
| " 59D. Large " " " | - " | .75 |
| " 59E, " Divider Points | . " | .50 |
| " 59F, Set Complete | each | 4.75 |

No. 59A will be sent unless otherwise ordered.



IMPROVED TRAMMEL POINTS, No. 50

| No. 50A, with 3-inch points Adjustableeach | 2.50 |
|---|------|
| No. 50B, " 3 " " not Adjustable " | 1.50 |
| No. 50C, Extra long points, 5 inchesper set | .35 |

No. 50A sent unless otherwise ordered.

Made of bronze metal, with forged steel points hardened. Either point can be removed, and the pencil socket accompanying each pair put in its place. Adjustable like spring dividers. Light and durable.

Fig. 5651D

STARRETT'S GAUGES

No. 185

Pig. 5652A

No. 186

No. 187

No. 286



Fig. 5652B

·O ··O ··• Fig. 5652C Fig. 5652D

| No. 185, Drill, Tap and Steel Wire Gauge, up to No. 60, drill Gaugeeach | 1.75 |
|---|------|
| No. 186, Drill and Steel Wire Gauge, up to No. 60, drill Gauge | 1.50 |
| No. 187, Jobbers Drill Gauge 1/6 to 1/2-inch by 64ths | 2.25 |
| No. 187, Jobbers Drill Gauge 1/6 to 1/2-inch by 64ths | 2.00 |
| | 1 |

WIRE GAUGES

No. 280

Nos. 188, 189, 281, 282, 283, 287







Fig 5652F

| No. 280, Steel I | Music Wire | Gaug | e, takes | Nos. | 12 to | 28 | | each | 1.50 |
|------------------|------------|---------|----------|--------|-------|------|-------|------|------|
| No. 188, Englis | h Standard | Wire | Gauge | takes | Nos. | 1 to | 36 | " | 2.00 |
| No. 189, " | | 66 | 46 | 44 | 44 | 6 . | 36 | " | 1.50 |
| No. 281, Ameri | can " | 66 | 44 | 46 | 66 | 0 " | 36 | " | 2.50 |
| No. 282, " | 44 | 66 | 44 | 66 | 66 | 5 " | 36 | " | 2.00 |
| No. 283, U.S. S | Standard W | Tire Ga | auge, ta | kes N | os. 0 | to 3 | 86 | | 2.50 |
| No. 287, W. & I | M. Standar | d Wire | Gauge | . take | s Nos | . 0 | to 36 | 44 | 2.50 |

Each Gauge tested after hardening.

No. 282 Gauge is furnished with decimal equivalents stamped on the back opposite each hole.

No. 283 Gauge numbers are those of the U.S. Standard.

Gauge for sheet iron and steel, adopted by Congress March 3rd, 1893.

STARRETT'S GAUGES

CENTER GAUGE

SCREW PITCH GAUGE No. 40





Fig. 2448A

CENTER GAUGES

Fig. 2448B

| Number | Description | Price Each |
|--------|--|---------------|
| 390 | Not tempered, graduated one corner each in 32ds, 24ths, 20ths. 14ths | .25 |
| 391 | Spring Tempered | .35 |
| 395 | Whitworth, not Tempered | .25 |
| 396 | Whitworth Spring Tempered | .35 |
| 397 | Metric, not Tempered | .25 |
| 398 | Metric, Spring Tempered | .35 |

The angles are 60°, except No. 395 and No. 396, in which they are 55°.

SCREW PITCH GAUGES

| Number | Pitches | Price Each |
|--------|---|---------------|
| 40 | 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40 | 1.00 |
| 4 | 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30 | 1.25 |
| 5 | 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82 | 1.25 |
| 6 | 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42 | 1.50 |

The teeth are sharp and clean cut. Can be used inside of a nut as well as on outside of a screw or bolt, and are convenient and reliable to use as a 60-degree center gauge, and gauge to test the grinding of either an inside or outside threading tool.

FOR WHITWORTH STANDARD THREAD ONLY

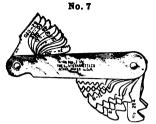


Fig. 2448C

U. S. STANDARD No. 155

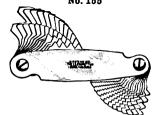


Fig. 2448D

| Number | Pitches | Price Each |
|--------|---|---------------|
| 7 | 4, 416, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 40, 48, 60 | 1.25 |
| 155 | 2½, 2½, 2½, 25, 234, 2½, 3, 3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 20 and center gauge with coarse and fine notch. | 1.50 |

STARRETT'S GAUGES

THICKNESS GAUGE OR FEELER

THICKNESS GAUGE No. 172 ENGINEER'S TAPER WIRE AND THICKNESS GAUGE No. 245



THICKNESS, GAUGES OR FEELERS, No. 72

Price, length 2¾ inches.....each | 1.50

These gauges have 22 leaves, varying in thickness by thousandths, running from .004 to .025.

THICKNESS GAUGES, No. 172

| Number | 172A | 172B | 172C |
|---|------------|------------|--------|
| Size of Case inches " " Leaves " Price each | 33/8 x 1/2 | 43/4 x 1/2 | 6½ x ½ |
| | 31/6 x 1/2 | 41/2 x 1/2 | 6 x ½ |
| | 1.00 | 1.50 | 2.00 |

These gauges have 8 leaves, viz., .002, .003, .004, .006, .008, .010, .012, .015. The eaves are tempered, and have the thickness marked upon them. Size A has a .0015 leaf also. Size A will be sent unless otherwise ordered.

ENGINEER'S TAPER, WIRE AND THICKNESS GAUGE, No. 245

Priceeach 3.50

These gauges in addition to No. 172B, have one more leaf, 1/6-inch, a taper and na English standard wire gauge.

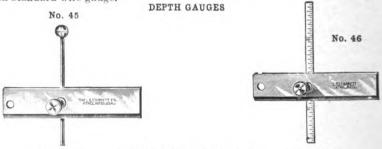


Fig. 5653D DEPTH GAUGES, No. 45 Fig. 5653E

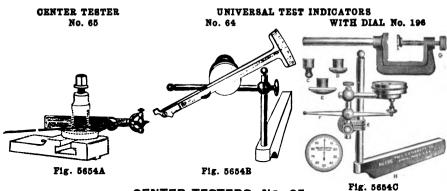
| Number | 45A | 45B | 45C |
|---------------------------------|------|------|------|
| Size of Stock inches Price each | 31/2 | 6 | 10 |
| Priceeach | . 75 | 1.15 | 1.35 |

DEPTH GAUGES, No. 46

| Number | 46A | 46B | 46C | 46D | 46E |
|---------------------|------|------|------|------|-------|
| Size of Stockinches | 31/2 | 31/2 | 6 | 6 | - 10 |
| " " Scale " | 4 | 6 | 4 | 6 | 6 |
| Price' each | 1 25 | 1 50 | 1.50 | 1 75 | 9. 95 |

Scale 36-inch wide, graduated in either 32ds and 64ths, 50ths and 100ths, or 64ths and 100ths.

STARRETT'S DEPTH GAUGES, TEST INDICATORS. ETC.



CENTER TESTERS, No. 65

This machine is designed to use in adjusting and locating centrally any point or hole in a piece of work operated upon in a lathe, chuck or on a face-plate; also to test the truth of lathe centers or a shaft between the centers.

UNIVERSAL TEST INDICATORS, No. 64

| Price, | Indicator | onlyea | ch | 2.50 |
|--------|-----------|---------------------------------|----|------|
| ** | 66 | with Tool-Post Holder, Complete | " | 2.75 |
| " | Tool-Post | Holder | " | .50 |

The working parts of the head are hardened. In setting the indicator bring the contact point against the work so that the needle will point to 0, when any variation either way will show.

UNIVERSAL DIAL TEST INDICATORS, No. 196

| Price. | , Indicator A or B, with three Contact Points | .each | 7.00 |
|--------|---|-------|------|
| " | Hole or Button Attachment | . " | 1.50 |
| 46 | Tool Post | . " | .75 |
| 44 | Surface Gauge Sleeve | . " | .75 |
| 46 | Extra Contact Points | . " | .10 |

The Indicator with Dial B will be sent unless otherwise ordered.



HEIGHT GAUGE ATTACHMENTS, No. 447

Price, Base only.....each | 1.00

The cut shows a steel base for holding inside Micrometer for use as a height gauge. The anvil end is even with the bottom of the base and the micrometer is held perpendicularly, making a reliable gauge. A slight turn of the knurled screw instantly clamps it to or releases it from the base.

Pig. 5654D

3.50

SURFACE GAUGES STARRETT'S







Fig. 5655A

Fig. 5655B

Pig. 5655C

Nos. 52 AND 53, SURFACE GAUGES

| Number | 52 | 53 |
|--|--------------|------|
| Price, 8-inch .each " 12 " " " 12 " with 6-inch Extension " " Sleeve alone " | 2.75 3.25 | 3.50 |
| No. 257 WITH CASE-HARDENED STEEL BASE | | |
| Price No. 257A 3 -inch Base, 9-inch Spindle | .each | 3.00 |

12 and 18-inch Spindle..... 4.00 In the base are four-gauge pins, frictionally held which may be pushed to bear against the edge of a surface plate, or in the slot of a planer bed for lineal work.

12-inch Spindle....





Fig. 5655D

Fig. 5655E

| No | . 56A | With | 4-inch | Spir | ndle and Auxiliary Guide | each | 3.00 |
|----|-------------|--------|--------|--------|--------------------------|------|------|
| " | 56B | Witho | ut Au | ıxilia | ry Guide | . " | 2.50 |
| " | 57A | 3-inch | Base | with | 9-inch Spindle | . " | 2.50 |
| 44 | 57B | 3 " | 66 | 66 | 9 and 12-inch Spindle | 64 | 2.85 |
| 66 | 57 C | 33/4" | " | 46 | 12-inch Spindle | " | 3.00 |
| " | 57 D | 334" | " | " | 12-inch Spindle | " | 3.50 |

SURFACE GAUGE ATTACHMENTS



| | • | |
|------|-------|--|
| Fig. | 5655F | |

| Price, Auxiliary Arbor onlyeac | ,50 |
|--------------------------------|------|
| " Complete | 1.50 |

STARRETT'S SPEED INDICATORS, ATTACHMENTS, ETC.



| Number | 104 | 106 | 107 |
|------------------------------|------|------|------|
| Price, in Pasteboard Boxeach | 1.00 | 1.50 | |
| " Leatherette Case " | 1.50 | 2.00 | 3.50 |

No. 104 may be run at the highest speed required without heating, on account of the frictionless bearing against which the inner end of spindle revolves.

No. 106 is an Improved Indicator, nicely made, finely working.

No. 107 is a Registering Speed Indicator and was devised to automatically register 100ths as well as units and tens.

Rubber Tips for pointed and hollow centers are furnished with the indicators.

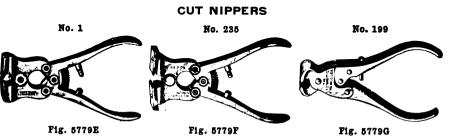
Pasteboard box will be sent unless otherwise ordered.



ATTACHMENTS

| Priceeach .50 | | | |
|---------------|-------|----------|-----|
| | Price | each | .50 |

This attachment applied to the speed indicator will enable a workman to determine the speed of shafting.



| Number | | 1 | 2 | 199 | |
|---|---------------------------------|--------------------------------|---------------------|------------------|-------------------|
| Size .inches Price per pair " Extra Jaws " " Screws per dozen " Splines " | 5½ 2.00 .50 .25 .25 | 7 2.50 .50 .25 .25 | 51/2 2.00 .50 | 7 2.50 .50 | 5 1.50 1.00 |

No 1 is made for music wire, common use, and bicycle use. In ordering specify for what use wanted.

STARRETT'S CENTER PUNCHES. NAIL SETS. SCREW DRIVERS, ETC.

CENTER PUNCHES

AUTOMATIC No. 18

MACHINISTS. No. 117



2017 Fig. 5778B

| Number | 18A | 18B | 117 |
|--------------------------|-----------|-----------|------|
| Length inches Price each | 5 2.00 | 6 2.50 | 4 20 |
| " Extra Points " | .15 | .15 | |

No. 18 automatic center punches (patent applied for) are provided with knurled adjusting screw caps, which, working in connection with a spring regulates the stroke. For work requiring a heavy mark, turn cap down; for work requiring a light mark turn it up, to use it, no hammer is required.

SPACING CENTER PUNCH No. 118

EXTRA HEAVY NAIL SETS



Fig. 5778C

Fig. 5778D

SPACING CENTER PUNCHES, No. 118

.75

NAIL SETS, Nos. 116 AND 176

| Number | 116 | 176A | 176B |
|------------------|------|------|------|
| Lengthinches | 4 | 5 | 5 |
| Price | .10 | | |
| "per dozen | 1.00 | 1.40 | 1.60 |
| " in Wooden Box" | 1.15 | | |

SCREW DRIVERS

MAGAZINE No. 557

POCKET No. 150





Fig. 5778E

Pig. 5778P

| Number | 557 | 150 |
|------------------------------|-----|-----|
| Price each " Nickel Plated " | | .25 |
| " Extra Blades | ∵iö | .30 |

TAP WRENCHES





Fig. 5778G

Fig. 5778H

| Number | 91A | 91B | 174 |
|-----------|-----|------|-----|
| Priceeach | .75 | 1.50 | .50 |

STARRETT'S LEVELS

BENCH LEVEL No. 130



Pig. 5657A

BENCH LEVEL WITH DOUBLE PLUMB No. 132



Fig. 5657B

| Sizeinches | 31/2 | 4 | 6 | 9 | 12 | 18 | 24 |
|--------------|------|------|------|------|------|-----------|------|
| No. 130 each | .30 | | | | | • • • • • | |
| " 132 " | | 1.35 | 1.50 | 1.65 | 1.75 | 2.00 | 2.25 |

ADJUSTABLE BENCH LEVEL Nos. 95 and 96



Fig. 5657C

IMPROVED LEVEL Nos. 97 and 98



Fig. 5657D

| Sizeinches | . 4 | 6 | 8 | •12 | †18 |
|---|---------------------|--------------|--------------|--------------|--------------|
| No. 95, with Plain Vialeach " 96. " Ground and Graduated Vial" | $\frac{1.00}{2.50}$ | 1.25 3.50 | 1.50 4.00 | 2.00 5.50 | 3.00 8.00 |
| " 96, " Ground and Graduated Vial " " 97, " Plain Vial " " 98, " Ground and Graduated Main Vial " | •••• | 1.75 4.00 | 2.00 4.50 | 2.50 6.00 | 3.50 8.50 |

*Nos. 95, 96, 97, and 98 have Plumb.

†Nos. 95, 96, 97, and 98 have Double Plumb.

These Levels have a concaved groove the length of base, leaving a flat margin each side which improves its seat for flat work while forming an absolutely true and reliable seat for shafting, etc., and is better than a V groove.

POCKET LEVEL No. 135



Fig. 5657E

ELECTRICIANS' LEVEL Nos. 197 and 198



Fig. 5657F

POCKET LEVELS, No. 135

| Lengthinches | 21/2 | 31/2 |
|---------------------------|------|------|
| Price, Nickel Plated each | .40 | .50 |

ELECTRICIANS' LEVELS, Nos. 197 AND 198

| Sizeinches | - | | |
|--------------------------------------|------|------|------|
| No. 197, with Plain Vial each | 2.50 | 3.50 | 4.50 |
| " 198, " Ground and Graduated Vial " | 4.50 | 6.00 | 8.00 |
| In Fancy Wooden Case, extra " | 1.00 | 1.00 | 1.00 |

The base is made of bronze, is non-magnetic and has concave groove in the bottom, running through the center full length, adapting it to rest on a shaft or pipe and a flat surface.



Fig. 5658B

STARRETT'S LEVELS AND PLUMB BOBS

ENGINEERS' AND PLUMBERS' LEVELS

No. 188



Fig. 5658A

| Number | 133A | 133B | 133C | 133D |
|------------------|------|------|------|------|
| Size inches | | 15 | 10 | 15 |
| | | 3.00 | 2122 | |
| " Ground Glass " | | | 5.75 | 6.00 |

Note.—Size A will be sent unless otherwise ordered.

The hinged tube inside the working faces of the frame, carrying a level glass, is adjustable to the graduated scale and shows any decline by 32ds (or less) to 2 inches to the foot without interfering in the least with the plumb or level.

CROSS-TEST LEVEL No. 136



Fig. 5658B

Pig.5658D

CROSS-TEST LEVEL AND PLUMB No. 134



Fig. 5658C

| Number | 136 | 134 |
|---------------|------------|---------|
| Sizeinches | 23/4 x23/4 | 2x3x1/6 |
| Weight ounces | 4 | 3 |
| Priceeach | .65 | 1.50 |

IMPROVED MERCURY PLUMB BOBS, No. 87



Each Plumb Bob is provided with a braided silk line. No knots to tie or untie. Simply draw the line into the peculiarly slotted neck at the top, after unwinding the required length, when the bob will hang perfectly true

STEEL PLUMB BOBS, No. 177
Same design as No. 87

| Sizeinches | 4x1/2 | 5x5/8 | 5½x7/8 | 6x1 |
|--------------------------|-------|-------|--------|-------|
| Weight ounces Price each | 23/4 | 5 | 81/2 | 141/2 |
| Priceeach | .75 | 1.00 | 1.50 | 2.00 |



STARRETT'S SCRIBERS, PIN VISES, ETC.

IMPROVED SCRIBER

IMPROVED ADJUSTABLE SLEEVE SCRIBER





Fig. 5659A

Fig. 5659B

IMPROVED SCRIBERS, No. 67

| Price, Completeeach | .45 |
|--|-----|
| " Without Long Point " | .35 |
| " Straight Point, Long or Short Bent Point " | .10 |

Length, with short bent point 9 inches; with long point 12 inches.

IMPROVED ADJUSTABLE SLEEVE SCRIBERS, No. 68

| Sizeinches | 8 | 12 |
|--------------------------------|-----|-----|
| Price, without Knife Pointeach | .50 | .50 |
| " Knife Point " | .15 | .15 |
| " Scriber Points " | .20 | .20 |

The 8-inch will be sent without knife point unless otherwise ordered.

POCKET SCRIBER

No. 70

PIN VISE No. 162





Fig. 5659C

Pig. 5659D

POCKET SCRIBERS, No. 70

| Number | 70 A | 70 B |
|-----------|------|------|
| Priceeach | .25 | .35 |

PIN VISES, No. 162

| Number | 162 A | 162 B | 162 C | 162 D |
|---|-------------------|---------------------|---------------------|--------------|
| Capacityinches Price, Nickel Platedeach | .0 to .040 .55 | .030 to .062 .55 | .050 to .125 .55 | .115 to .187 |

TOOL MAKERS' CLAMPS

No. 160

PARALLEL No. 161





Fig. 5659E

Pig. 5659F

| Number | 1 | 60 | 161A | 161B | 161C | 161D |
|---|------|------|-----------------|-------------------|------|-----------|
| Opening inches Length of Jaw " Price per pair | 1 | 2 | $\frac{114}{2}$ | $\frac{134}{212}$ | 3 3 | 23/4 4 |
| Priceper pair | 1.00 | 1.25 | 1.25 | 1.50 | 1.75 | 2.00 |

FOLDING RULES

BOXWOOD RULES



No. 57



No. 63

Fig. 638A

Fig. 638B

ONE-FOOT, FOUR-FOLD, NARROW

| Num- ber | Description | | | | Gr | Graduations | | | Price per Doz |
|-------------|-------------|-------|----------|--------|------|-------------|-------|------|------------------|
| 69 | Round e | Joint | , Middle | Plates | 8ths | and | 16ths | 5,8 | 1.75 |
| 65 | Square | 44 | • • • | " | " | 66 | 44 | 5,8 | 2.00 |
| 64 | - " | " | Edge | " | ** | 44 | 44 | 5% | 2.75 |
| 651/2 | 46 | " | Bound | | 44 | 66 | " | 5,6 | 5.50 |
| 55 | Arch | 46 | Middle | Plates | 66 | 46 | ** | 53 | 2.50 |
| 56 | 64 | 46 | Edge | 66 | 46 | 66 | 44 | 5, 3 | 3.50 |
| 57 | 66 | " | Bound | | ". | 46 | 44 | 5. | 6.25 |

TWO-FOOT, FOUR-FOLD, NARROW

| 68 | Round | Joint | , Middle Plates | 1 | 81 | ths a | nd 1 | 6ths | | 1 | 2.50 |
|-----------------|--------|-------|-----------------|-------|--------|--------|------|------------|--------|-----|------|
| 61 | Square | " | " " | | | " | 14 | 66 | | 1 | 3.00 |
| 63 | - " | " | Edge " | 8ths, | 10ths, | 12ths, | 16th | , Drafting | Scales | 1 | 4.00 |
| 84 | 66 | 44 | Half Bound | 66 | " | " | " | " | " " | 1 | 6.50 |
| 62 | 66 | 44 | Bound | 66 | " | " | 66 | 66 | 66 | 1 | 8.00 |
| $62\frac{1}{2}$ | 44 | 44 | " | - 66 | " | 66 | 44 | | | 3.4 | 8.00 |
| 53 | Arch | 46 | Edge Plates | " | 64 | " | " | Drafting | | î | 4.50 |

TWO-FOOT, FOUR-FOLD, BROAD

| 67 | Round | Joint. | Mid | dle Plates | | 8t | hs ar | d 16ths | | 13.8 | 3.50 |
|-------|--------|--------|------|------------|-------|--------|--------|----------|--------|-----------------|-------|
| 72 | Square | | | e Plates | 8ths, | 10ths, | 16ths, | Drafting | Scales | 13.8 | 5.00 |
| 77 | Double | Arch | Join | t, Bitted | " | 44 | 44 | " | 44 | $13\frac{3}{8}$ | 6.50 |
| 78 | 44 | 66 | " | Half Bound | " | 44 | " | 66 | 66 | 13.8 | 10.00 |
| 781/2 | " | ** | " | Bound | ** | " | " | " | 66 | 13 8 | 12.00 |

No. 3614







Fig. 638C

Fig. 638D

BOXWOOD CALIPER RULES

| Num- ber | | | escrip | | | | | Grad | ations | | Width Inches | Price per Dos. |
|-----------------|-----------|----|--------------|---|---|-------------|-------|--------|--------|-------|-----------------|-------------------|
| 36 36½ | Sq. Joint | | Inch. Foo | | | old | 8ths, | 10ths, | 12ths, | 16ths | 13/8 | 4.50 6.50 |
| 32 | Arch " | 46 | | | | Bdge Plates | | " | " | 44 | 1 1 28 | 7.00 |
| $32\frac{1}{2}$ | " | " | 44 | " | " | Bound | | | " | | 1 | 10.00 |

Note.—Prices listed are for Caliper Left Hand. When ordered with Caliper Right Hand, add .25 per dozen net. The Caliper is regularly graduated in 16ths, but can be furnished in 32ths, same price, if so ordered.

ENGINEERS' POCKET RULES

| Price, | Two F | oot, | Yellow | Finish, | Brass | Tips | each | .25 |
|--------|-------|------|--------|---------|-------|------|----------|-----|
| •• | Three | " | 44 | ** | ** | " | 66 | .35 |
| 44 | Four | " | 66 | " | 44 | ** | 64 | .50 |
| 44 | Five | 44 | " | • • | 44 | ** | 66 | .60 |
| " | Six | " | ** | " | " | " | 44 | .75 |

CIRCUMFERENCE AND SHRINKAGE RULES, ETC.

TINNERS' STEEL CIRCUMFERENCE RULES



Fig. 6727A

| No. | Lengt | :hfeet | 1 | 2 | 3 | 4 |
|-----|--------|----------------|-------|-------|----------------|---------------|
| 95 | Price, | Plainper dozen | | | 30.00 | 36.00 |
| 95 | ** | Nickeled | | | 36.00 | 42.00 |
| 96 | | Plain | 18.00 | 24.00 | 36.00 30.00 | 36.00 |
| 96 | " | Nickeled | 20.00 | 28.00 | 36.00 | 42.0 0 |

One side circumference rule, other side table of liquid, flaring, dry, pitch top cans, flat top cans and straight dry measures, except No. 96.

SHRINKAGE RULES



Fig. 6727B

| | Extreme Length, inches | | | | | | | | |
|----|---|------------------------------|--|-------|-------------------|-------|---------------|-------|------------------------------|
| 90 | Shrinkage, per ftinches Priceper dozen | $\frac{\frac{1}{16}}{24.00}$ | $24\overset{\overline{1}^{1}_{2}}{00}$ | 24.00 | $\frac{3}{24.00}$ | 24.00 | 3/16 24 00 | 24.00 | $\frac{\frac{5}{16}}{24.00}$ |

Tempered and polished steel 11/8x 34 inches.

IMPROVED SCALES



MAGIC PATTERN RULE



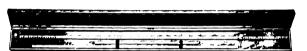


Fig. 6727E

MEASURING TAPES

"CHALLENGE"



"METALLIC" Flush Handle



"UNIVERSAL"



Fig. 2508A

Fig. 2508B

Fig. 2508C

CHALLENGE STEEL MEASURING TAPES WITH %-INCH TAPES

| Number | 260 | 261 | 263 | 264 | 265 | 266 |
|-----------------|-----|-------|-------|-------|-------|-------|
| Length feet | | 33 | 50 | 66 | 75 | 100 |
| Price per dozen | | 42.00 | 48.00 | 60.00 | 63.00 | 81.00 |

Marked in feet and 12ths (inches and eighths).

METALLIC MEASURING TAPES WITH %-INCH TAPES PLUSH HANDLE

| Number | 600 | 601 | | 603 | | | |
|---|-------|-------|-------|-------|-------|-------|-------|
| Lengthfeet | 25 | 33 | 40 | 50 | 66 | 75 | 100 |
| Price, marked one side onlyper dozen | 24.00 | 27.60 | 30.00 | 33.60 | 37.20 | 40.80 | 50.40 |
| Lengthfeet Price, marked one side onlyper dozen " marked both sides " " | 25.20 | 28.80 | 31.20 | 34.80 | 39.60 | 43.20 | 54.00 |

FOLDING HANDLE

| Number | | | | | | 505 | |
|---|-------|-------|--------------|-------|-------|-------|--------------|
| Lengthfeet Price, marked one side onlyper dozen " marked both sides " " | 25 | 33 | 40 | 50 | 66 | 75 | 100 |
| Price, marked one side only per dozen | 20.40 | 24.00 | 26.40 | 30.00 | 33.60 | 37.20 | 46.80 |
| " marked both sides " " | 21.60 | 25.20 | 27.60 | 31.20 | 36.00 | 39.60 | 50.40 |

METALLIC TAPES ONLY, WITHOUT CASES

| Lengthfeet | 25 | 33 | 40 | 50 | 66 | 75 | 100 |
|--|------|-------|----------------|-------|----------------|-------|-------|
| Price, marked one side only. per dozen "marked both sides" " | 9.60 | 12.00 | 14.40 15.60 | 16.80 | 19.20 21.60 | 21.60 | 31.20 |

Marked one side only 12ths; both sides in 10ths or 12ths and links.

JUNIOR METALLIC MEASURING TAPES, FLUSH HANDLES WITH %-INCH TAPES

| Number | 660 | 661 | 663 |
|-----------------------------|-----|-------------|-------------|
| Length feet Price per dozen | 25 | 33 24 00 | 50 27.00 |

UNIVERSAL MEASURING TAPES-BEND LEATHER CASES WITH 1/2 INCH LINEN CORDED TAPE

| Number | | | | | | | |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|
| Lengthfeet Priceper dozen | 25 | 33 | 40 | 50 | 66 | 75 | 100 |
| Priceper dozen | 11.00 | 12.00 | 13.00 | 14.00 | 15.00 | 16.00 | 18.00 |

WITH %-INCH LINEN CORDED TAPE

| Number | | | | | | | |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|
| Lengthfeet | 25 | 33 | 40 | 50 | 66 | 75 | 100 |
| Lengthfeet Priceper dozen | 12.00 | 13.00 | 15.00 | 16.00 | 17.00 | 18.00 | 20.00 |

PLUMB BOBS, ETC.

PLUMB BOBS

COMMON

BRASS, WITH STEEL POINT

ADJUSTABLE







Fig. 6212B



Pig. 6212C

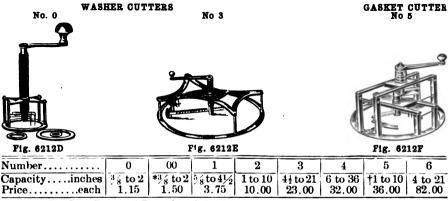
COMMON AND BRASS PLUMB BOBS

| Number | 1 | 2 | 00 · | 0 | 5 | 6 | 8 |
|----------------------------------|--------|------|------|------|------|-------|-------|
| Weightounces | 9 | 91/2 | 18 | 42 | 6 | 11½ | 16 |
| Price, Common per dozen "Brass " | 1.35 | 1.45 | 2.70 | 5.80 | - 05 | | |
| " Brass | ١ ٠٠٠٠ | | | | 7.20 | 10.00 | 11.40 |

ADJUSTABLE PLUMB BOBS

| Number | 1 | 2 | 5 |
|---------------------------------|-------|---------------|-------|
| Price, Bronze per dozen "Iron." | 21.60 | 2 5.20 | 12.00 |

ROSE WASHER AND GASKET CUTTERS



^{*} In Ox. Cop. Plate. †Round and Oval. Glass Cutter Attachment, for Nos. 1 to 5, 2.00; No. 6, 3.50

SCREW DRIVERS

ELECTRIC



Fig. 5703A

| Length of Bladeinches: 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 |
|--------------------------|------|-------|------|------|------|------|------|------|
| | | | | | | | | |
| Priceper dozen 3.30 | 3.45 | 3.60 | 4.00 | 4.40 | 4.60 | 5.15 | 5.60 | 5 75 |
| Triceper dozen 0.00 | 0.30 | 17.00 | 1.00 | 3.30 | 1.00 | 0.10 | 0.00 | 0.10 |

PERFECT HANDLE



Fig. 5703B

| Length of of Bladeinches | 4 | 5 | 6 | 7 | 8 | 10 | 12 |
|-------------------------------|-------------------|------|------|------|------|-------|-------|
| Diameterinches Priceper dozen | $\frac{14}{4.25}$ | 5.00 | 6.00 | 7.00 | 8.00 | 10.00 | 12.00 |

Nos. 912 AND 1012



Fig. 5703C

| Number | 91/2 | 101/2 |
|------------------------|-------|-------|
| Length Over All inches | 91/2 | 101/2 |
| " of Blade | 41/2 | 5 |
| Size of Square " | 7/6 | 9/6 |
| Width of Point " | 1/2 | 3/4 |
| Thickness of Point | 5 | 5 |
| Priceper dozen | 12.00 | 13.00 |

CHAMPION



Fig. 5703D

| Blade inches | | | | | | | | | | |
|-----------------|------|------|------|------|------|------|------|------|-------|-------|
| Price per dozen | 3.00 | 3.50 | 4.25 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 10.00 | 12.00 |

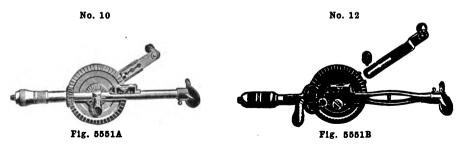
B AND S "ALL STEEL"



Fig. 5703E

| Number | | 13 | 14 | | 16 | | | | 20 |
|---|-----------------------|------|------|------|-------|-------|------|-------|-------|
| Length Over Allinches | 5 | 8 | 9 | 10 | 111/2 | 121/2 | 14 | 16 | 18 |
| Length Over Allinches " of Blade " Priceper dozen | $\frac{2^{3}4}{3.00}$ | 4.50 | 5.00 | 6.00 | 7.00 | 8.00 | 9.00 | 101/2 | 121/2 |

BREAST DRILLS



No. 10 BREAST DRILLS

Price......per dozen | 36.00

These drills are with ball bearings, nickel plated stock and chuck, cocobola handles, extension crank, alligator jaws, which hold both round and square shanks, and a patent level attachment. Have cut gears changeable from even to speeded, 3 to 1.

No. 12 BREAST DRILLS-IMPROVED

Price No. 12 Breast Drill......per dozen | 30.00

Has cut gears changeable from even to speeded, 3 to 1, adjustable crank and level attachments to show when being held true. Master chuck holding round, square and taper shanked drills.



Nos. 19 AND 190 BREAST DRILLS

| | | | _ | | | | | | | | | | | |
|----------|--------|-------|-------|------|------|---------|---------|---------|------|-----------|------|-------|-------|------------|
| . | | 40 | | | | | | | | | | | A | വെവര |
| Price | \sim | 14 | | | | | | | | | | . ner | aozen | 21.00 |
| 11100 | 110. | 10 | | | | • • • | • • • • | | | • • • | | . P | | |
| | | 300 | | | | | | | | | | | 44 | 24.50 |
| " | •• | i uni | | | | | | | | | | | •• | 1 24 . iJU |
| | | 100 | | | | • • • · | | | | | | • | | |
| | | | | | | | | | | | | | | |

With ball bearings and alligator jaws, gearings changeable from even, to speeded 3 to 1.

No. 190 same as No. 19 except has Nickel Plated Chuck and Stock.

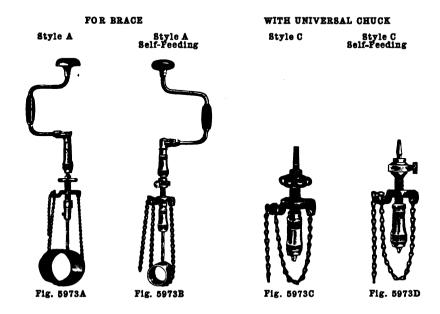
No. 130 BREAST DRILLS

| Priceper dozen | 48.00 |
|----------------|-------|

Double geared and cut gears, Cocobola Handle, Nickel Plated Stock and Chuck. Speed at 4½ to 1. Holds all sizes round shank bits from 0 to ½-inch.

CHAIN DRILLS

FOR METAL OR WOOD-BALL BEARING



| Style | A | В | C | D |
|--|----------------|----------------|----------------|----------------|
| Price, Plain Feed per dozen "Self-Feeding" | 24.00 48.00 | 24.00 48.00 | 33,00 60.00 | 27.00 52.00 |
| Den't eeuing | 20.00 | 40.00 | 00.00 | 02.00 |



Fig. 5973E

Above prices do not include brace or twist drills.

Style A. For ½-inch Round Shank drills, Style B. For Standard Square Shank Bit Stock drills.

Style C. Fitted with Universal Chuck and takes round shank or

bit stock drills 1/4 to 1/2-inch.

Style D. With extra long chuck, a combination of styles A and B. The first opening will fit round shank drills, above this a square taper that will take square shank drills.

No. 25, COMBINATION BREAST AND CHAIN DRILLS

This drill has two speeds, spirit level, adjustable crank with 21/2-inch variation and takes both round and square shank drills. It can be used as a plain breast drill.

45.00





PLIERS







GAS PLIERS

Pig. 5719A

7. a. c. a.

| | _ | Fig. | 5719B |
|--------|--------|------|-------|
| LIDNED | DILEDO | | |

| Lengthinches | 5 | 6 | 7 |
|--|------|-------|-------|
| Price, Polishedper dozen "Nickel Plated" | 8.00 | 9.00 | 10.00 |
| | 9.25 | 10.50 | 11.75 |

GAS PLIERS

| Lengthinches | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---------------------------------------|-------|-------|-------|-------|-------|-------|-------|
| Black Handlesper dozen All Polished " | 12.00 | 14.00 | 15.00 | 16.00 | 18.00 | 21.00 | 24.00 |
| | 15.00 | 17.00 | 18.00 | 19.00 | 21.00 | 24.00 | 27.00 |

IMPROVED COMBINATION PLIERS

Gas Pliers, Wire Cutters, Wrench and Screw Driver Combined





Fig. 5719C

Pig. 5719D

No. 60 B. B. SIDE CUTTING COMBINATION PLIERS



| Lengthinches | | 8 | 10 | 14 |
|---|--------|-------|-------|-------|
| Imp. Combination Pliers Black Finishper dozen | 13.50 | 16.00 | 18.00 | 24.00 |
| " " Nickel Plated " | 15.00 | 18.00 | 21.00 | 30.00 |
| Plier Bolts, Black Finisheach | .071/2 | .08 | .10 | .10 |
| " Nuts " | .05 | .06 | .06 | .06 |
| No. 60 B.B. Combination Pliers, Blued per dozen | 5.00 | | | |
| " " " " Nickel Plated " | 5.00 | | | |









Pig 5719G

ROUND AND FLAT NOSE PLIERS

| Lengthinches | 4 | 41/2 | 5 | 6 | 7 | 8 |
|--|------|------|-------|-------|---------------|-------|
| Price, Black,per dozen "Nickel Plated" | | | | | 9.50 15.50 | |
| Mickel Flateu | 9.40 | 0.40 | 10.00 | 11.00 | 10.00 | 20.00 |



PLIERS, NIPPERS, ETC.

DIAGONAL CUTTING PLIERS







Fig. 5625A

DIAGONAL CUTTING PLIERS

| Length | inches | 41/2 | 5 | 6 | |
|---------------|----------|-------|-------|-------|--|
| Price, Blackp | er dozen | 11.00 | 12.25 | 14.50 | |

END CUTTING NIPPERS

| Lengthinches | 4 | 4½ | 5 | 6 | 8 |
|-----------------------|------|------|------|-------|-------|
| Price, Blackper dozen | 8.20 | 8.50 | 8.75 | 14.00 | 17.50 |

SIDE CUTTING PLIERS

COMBINATION PLIERS AND WIRE CUTTERS





Fig. 5625C

SIDE CUTTING PLIERS

Fig. 5625D

| Lengthinches | 5 | 6 | 7 | 8 |
|------------------------|-------|-------|-------|-------|
| Price, Black per dozen | 12.50 | 13.50 | 17.00 | 20.00 |
| " Nickel Plated " | 17.00 | 20.00 | 24.00 | 27.00 |

COMBINATION PLIERS AND WIRE CUTTERS

| Length inches | 41/2 | 6 | 8 | 10 | 12 |
|---|------|------|------|------|------|
| Will Cut Wirenumber Price, Blackper dozen | 14 | 11 | 8 | 6 | 5 |
| | 3.00 | 3.30 | 4.30 | 5.65 | 9.00 |

PORTER'S "NEW EASY" BOLT CLIPPERS



Fig. 5625E

| Number | 0 | 1 | 2 | 3 |
|--|-----|---------------------|------------------|-------------------|
| For Boltsinches Weightpounds Priceeach | 5/6 | 3/8 53/4 5.00 | 1/2 9 7.00 | 5/8 13 9.00 |

Nos. 0 and 1 have open handle grips. Nos. 2 and 3 have solid grips. Adjusted by set screw. No special wrench or shims required.

TINNERS' SNIPS, SOLDERING COPPERS, ETC.





Fig. 5595A

BENCH SHEARS

Pig. 5595B

BUFFALO





Fig. 5595C

TINNERS' SNIPS

Fig. 5595D

| Number | 10 | 9 | 8 | *8L | 7 | 6½ |
|-------------|--------------------------|-------------------------|--------------------------|------------------|--------------------------|---------------------------|
| Full Length | 11 2½ 1.40 2.25 | 12 3 1.50 2.50 | 13 3½ 2.00 3.00 | 13 3½ 2.50 | 14¼ 4 2.50 3.50 | 15¾ 4½ 3.00 4.25 |

^{*}No. 8L Left Hand, for left-handed persons, and add .50 net extra for curved lip.

BENCH SHEARS

| Number | 00 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|--|----|----------------------|-----------------|--------------------|--------------------|-----------------|----------------|-----------------|
| Weight pounds Length of Jaws inches Price per pair | 12 | 29 101/2 12.00 | 21 9 8.00 | 17 85/8 7.00 | 13 83/8 6.00 | 10 8 5.00 | 8 7 4.00 | 6½ 6 3.50 |

BUFFALO SNIPS

| Number | 19 | 18 | 17 |
|-------------|------|------|------|
| Cuts*inches | 3 | 31/2 | 4 |
| Price | 1.50 | 2.00 | 2.50 |

^{*}For either curves or straight cuts.

SOLDERING COPPERS

POINTED PATTERN

FLAT PATTER



ROOFING PATTERN

Fig. 5595F

SWIVEL HATCHET PATTERN





| Pointed, Weight per pair: | $1, 1\frac{1}{2}, 2, 2\frac{1}{2}, 3, 4, 5, 6, 7, 8, 9, 10, 12 lbsper lb.$ | .40 |
|---------------------------|--|-----|
| Flat, " " | 2, 3, 4, 5, 6, 7, 8 | .40 |
| Hatchet " " | 3 lbs. and heavier " | .50 |
| Roofing or Tinners' | " | .50 |

DEXTER VALVE RESEATING TOOLS

OUTFIT No. 3



Pig. 8372∆

VALVE RESEATING MACHINES WITH DEXTER DISC CUTTER

| Number | 3 | 4 | 6 |
|----------------------------------|---|-------------------|--------------------|
| For Valves Sizesinches Priceeach | | 1/4 to 4 90.00 | 1/4 to 6 125.00 |

TURRET LATHE DISC CUTTER

VALVE RESEATING MACHINE WITH DEXTER DISC CUTTER

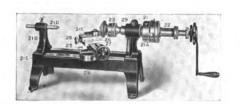






Fig. 8372C

VALVE RESEATING MACHINES WITH TURRET LATHE DISC CUTTER

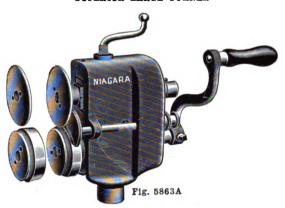
| Number | 3 | 4 | 6 |
|--------------------------------------|---|--------------------|--------------------|
| For Valves Sizes. inches Price. each | | 1/4 to 4 102.50 | 1/4 to 6 137.50 |

VALVE RESEATING MACHINE WITH DEXTER DISC CUTTER

| Number | 8 | 10 | 12 |
|-------------------------------------|----------|-----------|-----------|
| For Valves Sizes. inches Price each | 1/4 to 8 | 1/4 to 10 | 1/4 to 12 |

TINNERS' BENCH MACHINES

SUPERIOR LARGE TURNER



SUPERIOR LARGE BURR

SUPERIOR WIRING MACHINE



| g. 5863B |
|----------|
|----------|

Fig. 5863C

| | Description | Shipping Weight Pounds | Price With Stand Each |
|----------|---|------------------------------|-----------------------------|
| Superior | Large Turning Machine, with Extra Upper and Lower Faces | 38 | 11.50 |
| ٠., | Small " " " " " " " " | 34 | 11.25 |
| " | Extra Small Turning Machine | 2 8 | 12.00 |
| 46 | Large Burring Machine, with Extra Upper Face | 32 | 10.50 |
| 44 | Small " " " " " | 28 | 10.00 |
| 44 | Wiring Machine | 38 | 14.00 |

If without Standard, deduct .75.
If with Treadle Attachment in place of Crank Screw, add 4.00.

If with Tight Pulley, add 3.00.

The Extra Small Turner has faces of the same diameter as the Small Burr.

These Machines have Removable Faces, Interchangeable Parts, adjustment for Wear, Brass Boxes, etc.

TINNERS' STAKES

CAST-IRON WITH POLISHED FACES

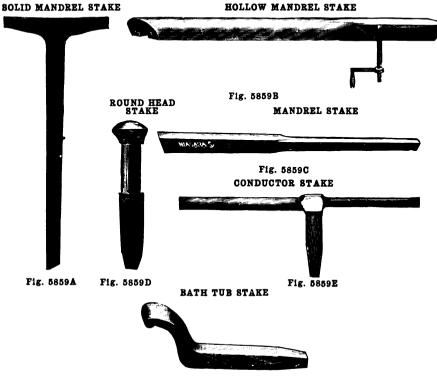


Fig. 5859F

| Des | crip | tion | | | | | | | | | | | | | | eight Lbs. | Price Each |
|-----|------|------|---------|---------|-------|--------|--------|-------|---------|-------|--------|------|-------|--------|----|---------------|---------------|
| No. | 00 8 | olid | Mand | rel. 60 | inch | es lo | no t | o the | Stand | ard | | | | | | 130 | 10.00 |
| " | 0 | 66 | 46 | 40 | 66 | 46 | 115 (6 | " | 16 | | | | | | | 80 | 6.00 |
| 46 | 1 | 44 | 66 | 34 | 66 | 46 | 44 | 66 | 66 | | | | | | | 60 | 5.00 |
| 66 | 9 | | 46 | 30 | 46 | | | 66 | 66 | | | | | | | 40 | 4.00 |
| 44 | - | | 44 | | 66 | 44 | - 66 | 66 | 44 | | | | | | | Carlo | 7000 |
| " | 21/2 | 3 | | 30 | 66 | 46 | | | | | or 2-i | | | | | 30 | 4.00 |
| | 0 | " | " | 27 | | | | | | | | | | | | 30 | 3.00 |
| | | | | | | | | | | | | | | | | 10 | 1.25 |
| No. | 000 | Holl | ow Ma | indrel, | 36 i | n. lor | 1g, 3 | in. d | iamete | r | | | | | | 30 | 5.00 |
| 66 | 0 | 66 | | 46 | 40 | 46 46 | 4 | 46 | 46 | | | | | | | 50 | 5.50 |
| 60 | 00 | 66 | | 44 | 60 | 66 66 | 4 | % in. | 44 | | | | | | | 94 | 10.00 |
| | | 61 | | 44 | 48 | 46 46 | 11 | 3/4 " | 66 | | | | | | | 300 | 25.00 |
| Iol | low | Man | drel F | astene | rs | | | | | | | | | | | | .60 |
| No. | 12 N | Iand | rel Sta | ake, ro | und | ed pa | rt 26 | in. l | ong, er | ntire | lengt | h 44 | 1/6 i | nche | es | 50 | 5.00 |
| 44 | 10 | ondi | ctor. | turned | l. la | rge e | end | 21/x1 | 5 in | small | end | 11/ | x11 | 1/6 in | | 30 | 4.00 |
| 66 | 2 | 46 | , | 66 | 6 | | 64 | 13/x1 | 4 " | 66 | 66 | 11 | x10 | | | 20 | 3.00 |
| Bat | h Tu | ıb | | | | | | | | | | | | | | 12 | 1.25 |
| Dot | ble | Sear | ning v | vith F | our . | Head | S | | | | | | | | | 100 | 9.00 |
| | | | | ouble | | | | | | | | | | | | 200 | 1.50 |

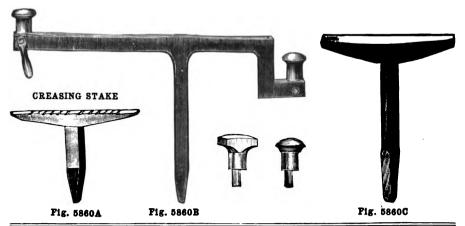
^{*}The flat part of this stake is 15 inches wide.

TINNERS' STAKES

WROUGHT IRON WITH STEEL FACES

TEA KETTLE STAKE

HATCHET STAKE



| DESCRIPTION | Weight Pounds | Price Each |
|---|------------------|---------------|
| No. 1 Beakhorn | 50 | 15,00 |
| " 2 " | 40 | 13.25 |
| " 4 " | 30 | 10.00 |
| " 1 Double Seaming; large end, 17 inches; small end, 12 inches | 40 | 9,00 |
| " 2 " both ends 11 inches | 32 | 8.00 |
| " 0 Conductor, both ends 14 inches long, 17% and 13% in. diameter | 24 | 6.00 |
| " 00 " long end $2x20$ inches, short end $1\frac{1}{2}x14$ inches | 34 | 7.00 |
| " 1 Bevel-edged Square, face 3 x 5 inches | 13 | 6.00 |
| " 2 " " " 2½x4½ " | 12 | 5.00 |
| Blowhorn, large end 9 inches, small end 171/2 inches | 14 | 5.00 |
| Creasing, with horn, round end 91/2 inches, flat end 61/2 inches | 13 | 4.50 |
| Common Creasing, 141/2 inches long | 13 | 4.00 |
| Coppersmiths' Square, face 25 gx41/2 inches | 11 | 3.50 |
| Common Square, face 25/8x41/2 inches | 11 | 3.00 |
| Large " " 3½x5½ " | 15 | 7.00 |
| Small " " $2\frac{3}{8}x1\frac{1}{2}$ " | | 2.00 |
| Candle Mould, small end 18 inches, horn 8½ inches | 4 8 | 2.75 |
| Needle Case, flat end 8 inches, small end 10½ inches | š | 2.25 |
| Tea Kettle with four heads. | 50 | 15.75 |
| Heads for Tea Kettle | | 1.75 |

HATCHET STAKES

| Number | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------------|------|-------|------|------|------|------|
| Length of Bladeinches | 16 | 141/2 | 13 | 11 | 9 | 7 |
| Weightpounds | 13 | 10 | 9 | 7 | 5 | 4 |
| Priceeach | 5.00 | 4.25 | 3.50 | 2.75 | 2.25 | 1.75 |

BOTTOM STAKES

| Number | 1 | 2 | 3 | 4 |
|-------------|------|------|------|-----|
| Widthinches | 13/4 | 11/2 | 11/4 | 1 |
| Price each | | .80 | . 75 | .50 |

TINNERS' MACHINES

IMPROVED SHEET IRON FOLDERS FOR No. 24 IRON AND LIGHTER



IMPROVED SHEET IRON FOLDERS

| O | | | | | |
|-----------------------------------|-------------|--------------|--------------|--------------|----------------|
| Sizeinches | 30 | 42 | 60 | 72 | 96 |
| Shipping Weight pounds Price each | 80 10.00 | 120 18.00 | 280 25.00 | 415 60.00 | 1060 100.00 |

The 96 inch Folder is furnished with Counterbalanced Bar. These Folders are so constructed that the gauge always moves in a line parallel with the edge of the Folding Plate. Furnished with Steel Handle in place of Wood Handle. Width of Locks from 1/6 to %-inch.

ADJUSTABLE PIPE FOLDERS

| Size | | |
|-----------------------|-------|-------|
| Shipping Weight | 30 | 42 |
| Shipping Weightpounds | 90 | 130 |
| Pricepoundseach | 14.00 | 24.00 |

The Pipe Folders have an Adjustable Gauge for Locks from 3 to %-inch wide,

UNIVERSAL FOLDER AND BRAKE

FOR No. 20 IRON AND LIGHTER



Fig. 5864A

| Sizeinches | 42 |
|--|-------|
| Shipping Weightpounds | 485 |
| Price, including one Blade for Sharp Lockseach | 65.00 |
| " Adjustable Front Gauge, Extra" | 4.50 |
| " Iron Legs Extra | 9.00 |

Iron Legs add 115 pounds to the weight.

This machine combines the advantages of an ordinary Folder with those of a Cornic Brake.

Clamping Bar has a parallel motion up and down of 1 inch, and when in the lower position gives a firm grip upon the material. The two screws on top of the frames are used to fix the lower position of the clamping bar when more or less space is needed for the material or forming bars. The largest space obtainable between the clamping bar, when in the upper position, and the bed is 3 inches.

bar, when in the upper position, and the bed is 3 inches.

The Swinging Folding Bar is adjustable up and down to permit of making round as well as sharp bends. It is made of solid steel, the upper edge being 3% of an inch wide, so that small members can be formed. For ordinary work an angle shaped bar is attached, which increases the width to 1 inch.

Folding Blade around which the material is bent is fastened by means of screws, and it can easily be removed to permit of substituting others of different profile.

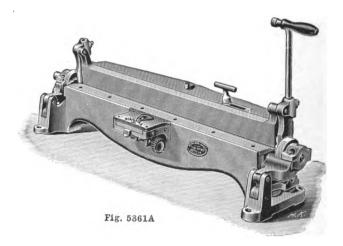
Back Gauge is adjustable from 1/2 to 10 inches, and it can be removed entirely. The rods that carry the gauge are graduated in sixteenths of an inch.

On the end of the folder there is a segment-shaped casting carrying Adjustable Stops to regulate the angle of the bend. The stops can be thrown instantly in and out of position.

Front Gauge adjustable for locks from 1/4 to 3/4 inch wide, can be provided at extra cost.

KEYSTONE BAR FOLDERS

FOR OPEN AND CLOSE LOCKS



| Sizeinches | 17 | 21 | 30 | 36 | 42 | 60 |
|---|-----|----------------------------------|-------------------------------|-------------------------|-----------------------------|----------------|
| For Locksinches Shipping Weightpounds Priceeach | 105 | $^{\frac{3}{32}}$ to 1 120 30.00 | $\frac{3}{32}$ to 1 220 40.00 | 32 to 1 260 60.00 | 3/8 to 15/8 510 90.00 | 1100 200.00 |

Foot Treadle and Spring Attachments will be furnished with sizes 17 and 21-inch Folders, at an additional cost of 12.00.

Folders 30-inch and larger have Sockets for the Handle at both ends of the Machine. These machines fold narrow and wide Locks at various angles, form square joints and turn rounded edges ready to insert a wire. They form an edge of uniform width the entire length. Intended for Tin and Light Sheet Metal.

The gauge is adjusted by means of a knob on the side of the extension, and its adjustment, in fractions of an inch, is indicated on the graduated dial. This arrangement enables the operator to set the gauge quickly without measuring or trying. The adjustment of the folding bar for round or open locks is accomplished quickly and with ease, by means of the socket wrench shown in cut. This wrench is used to raise and lower the wing or folding bar by means of a wedge operated by rack and pinion, and the same wrench is used to fasten the wedge securely by a screw.

When adjusted for round or wire edges, the folding blade remains flush with the gripping jaw until the operator begins to bend the edge. This permits of entering the work into the gripping jaw without difficulty.

The Folders are adjusted for IC and IX tin, or other sheet metal of the same thickness. For thicker material the machine must be readjusted. Adjustable Stop for any angle is now attached to the Folder.

The parts of these Bar Folders are made on the interchangeable plan and duplicate parts can be furnished.

Specify number of the part wanted and the size of machine.

The 60-inch Bar Folder is made with the gripping jaw stationary to avoid the necessity of lifting the heavy weight in clamping on: the frame carrying the folder blade moves downward.

These folders are suitable for round or wire edges, as well as sharp bends.

QUEEN CITY SQUARING SHEARS

FOR No. 18 IRON AND LIGHTER



Fig. 5855A

| Lengthinches | 22 | 30 | 36 | 42 | 52 | 62 |
|-----------------------|-------|-------|-------|--------|--------|------------------|
| Shipping Weightpounds | 360 | 500 | 600 | 750 | 900 | $1200 \\ 210.00$ |
| Priceeach | 40.00 | 55.00 | 80.00 | 110.00 | 170.00 | 210.00 |

If 30-inch and smaller are desired with Hold-Down, add, each. 5.00.

The above prices include a Top Shelf for 22, and 30-inch Shears.

Prices of 36-inch and larger include a Hold-Down Attachment.

Side Legs and Guides for Cutter Bar are in one piece.

Provision is made to compensate for the wear of the Knives and Guides.

The knives are made of best materials and ground true.

Graduated Scale is marked on Bed.

On Shears 36 inches and longer, it is advisable to use a Hold-Down Attachment in front of the Cutter Bar to insure a straight cut.

These Shears are furnished with a set of Front, Back, Bevel, and Side Gauges.

Shears up to 36 inches long are furnished with a Micrometer Back Gauge, unless otherwise ordered.

BUFFALO PUNCHES, SHEARS, AND ANGLE CUTTERS

PUNCH No. 12B COMBINED PUNCH AND SHEARS No. 2B

ARMOR PLATE ANGLE CUTTER







Pig. 6762B



Pig. 6762C

PUNCHES AND SHEARS

| Number | *11 | *11B | 12 | 12B | 13 |
|-------------------------------------|-----------|-------------|-------------|--------------|----------------|
| Capacityinches | 1/8X1/8 | 1/8X1/8 | 1/8×1/8 | 1/8×1/8 | 1/4×1/4 |
| Size Punches Furnished " | 3 and 1/8 | 3 and 1/8 | 3 and 1/8 | 3 and 1/8 | 1/8 and 1/4 |
| Depth Throat " | 4 | 4 | 4 | 4 | 4 |
| Weight pounds | 26 | 26 | 26 | 26 | 80 |
| Price, Front Lever, no Stand each | 15.00 | | | | |
| " Rear " " " " | | 15.00 | | | |
| " Front " with " " | | | 20.00 | | 40.00 |
| " Rear " " " " | | | | 20.00 | |
| Number | 14 | †13B | †14B | †15B | 2B |
| Capacityinches | 3/8X3/8 | 1/4×1/4 | 3/8X3/8 | 5/8x1/2 | 1/4×1/4 |
| Size Punches Furnished " | 5% and 3% | 1/8 and 1/4 | 5/6 and 3/8 | 14,3/8 & 1/2 | 1/8, 3/6 & 1/4 |
| Depth Throat " | 414 | 4 | 41/4 | 51/2 | 4 |
| Weight pounds | 130 | 80 | 130 | 245 | 125 |
| Price, Front Lever, with Stand each | 50.00 | | | | |
| " Rear " " " " | | 40.00 | 50.00 | 70.00 | 50.00 |

^{*}Mounted on wood blocks for bench use. Balance of punch stands are cast iron, armour plate frame, drop forged steel fittings. Nos 13 and 14 on special order built with rear lever. †Back lever similar to No. 2B. but larger capacity.

Nos. 3B and 4B same construction as 2B,

ARMOR PLATE ANGLE CUTTERS

Cuts angles $2\frac{1}{2}x\frac{2}{4}$ inches. Weight 200 pounds, Armor plate frame, crucible steel knives, forged steel levers and links. Price, each, 40.00

ARMOR PLATE SLITTING SHEARS

No. 2



Pig. 9498A



Fig. 9498B

| Number | 2 | 3 | 21 | 22 |
|---------------------------------|-------------|---------------------------------|----------|-----------|
| Shears Sheet Metal, Gauge No | 10 | 8 | | |
| Shears Plates, Thickness inches | | 1 | 3∕4 | 1/4 |
| Cuts Flat Bars " | 1/4 x 3 1/4 | | 2½ x 3/6 | 21/2x 1/6 |
| Cuts Tees " | 7474 | 5/6 x 31/2 11/2 x 11/2 x 3/6 | -/2/10 | -/2-/10 |
| Weight pounds | 160 | 200 | 75 | 115 |
| Priceeach | 60.00 | 80.00 | 60.00 | 80.00 |

Fig. 9498C

PYGMY

| Number | 0 |
|-------------------------------|-------|
| Shears Sheet Metal, Gauge No. | 20 |
| Cuts Flat Barsinches | 1⁄4x3 |
| Weight pounds | . Š |
| Priceeach | 20.00 |

Stop for just a moment and think what it means to have your punches, shears, angle and tee cutters, etc., built of armor plate steel instead of cast iron. No more cast iron flaws or broken machines because it happens to be a cold morning.

Armor-plate steel is the toughest and strongest material known.

Unlimited strength and the highest degree of efficiency, combined with lighter

weight make these the best machines on earth.

They are absolutely indestructible and are equipped with the highest power leverage known to mechanical science. They are accurate in their work, easy in operation and can always be depended upon to perform any work, from the lightest up to their maximum capacity.

The tensile strength of cast iron is 10,000 pounds, and of armor-plate steel 75,000 Think this over. It means a considerable saving in weight and space and a

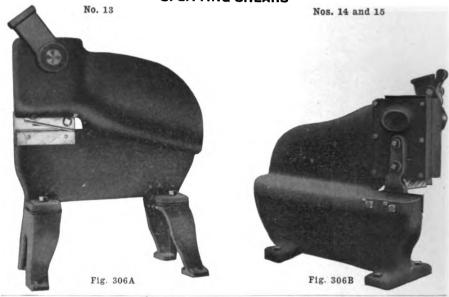
tremendous gain in strength and efficiency.

Armor-plate steel, with its extraordinary strength and elasticity, is well adapted to meet the sudden heavy and irregular strains this class of tool is subjected to.



PUNCHES AND SHEARS





| Number | 13 | 14 | 15 |
|--|----|----|-----------------|
| Cuts Plate Iron inches Length of Knives. " Weight pounds | | | 1/2 7 850 |

Iron legs as shown in cut of No. 13 Shear can be furnished with any of the above machines. Unless specified legs are not shipped nor included in price.

COMBINED PUNCHES AND SPLITTING SHEARS

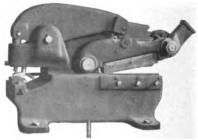


Fig. 306C

| Number | 3A | 3B | 3C |
|-----------------|-----|-----|-----|
| Cuts Plate Iron | 1/8 | 1/4 | 3/8 |
| | 1/4 | 5/6 | 3/8 |
| | 1/4 | 1/4 | 3/8 |
| | 300 | 375 | 600 |

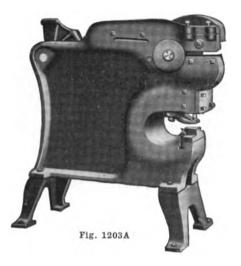
Prices on above Punches and Shears on application.

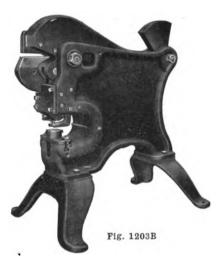
PUNCHES AND SHEARS

COMBINED PUNCHES AND SHEARS

No. 5







| Number | 5 | 6 |
|--|---------------------------|-----------------|
| Cuts Flat Iron | 1/2 x 5 1/4 1/4 x 8 | ½ x 4 1 |
| Will Punch Holes, Diameter " " " Through Iron " " to Center of Circle " Weight pounds | 5/8 5/8 16 950 | 12 12 675 |

No. 3 SPLITTING SHEARS



| Shears Sheet Metalinches | 1/8 |
|--------------------------|---------------|
| Cuts Round Ironinches | 1/2 |
| Weightpounds | $\frac{1}{2}$ |

No. 3 Shear has adjustable knives which can be quickly removed and sharpened when desired.

Prices on all above machines on application.

BENDING ROLLS AND SHEARS

IMPROVED BENDING ROLLS

PATENTED AUTOMATIC OPEN, CLOSING, AND SELF-ADJUSTING

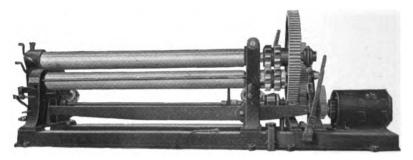
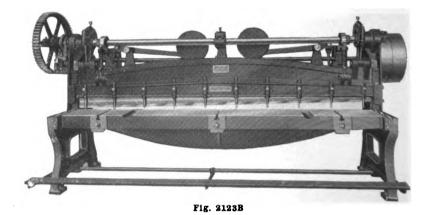


Fig 2123A

SQUARING SHEAR



Prices on application.

"BELL" IMPROVED STEAM HAMMERS

SINGLE FRAME, STANDARD GUIDE



Fig. 5873A

Above hammer can be furnished in 14 sizes, from 350 to 5,000 pounds. Falling weights—Bulletin 1007.

Double frame guide hammers in 20 sizes, from 1,100 to 30,000 pounds. Falling weights—Bulletin 1010.

Combined hammers in 4 sizes from 100 to 400 pounds. Falling weights—Bulletin 1008.

Open frame hammers in 4 sizes, from 250 to 1,500 pounds. Falling weights—Bulletin 1009.

CALDWELL HYDRAULIC WHEEL PRESSES

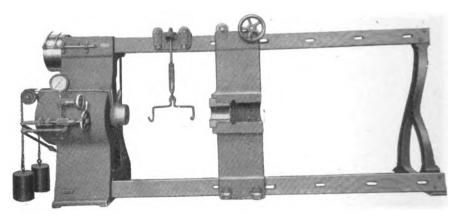
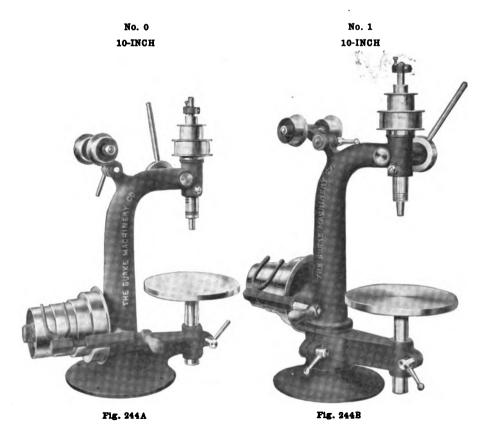


Fig. 5916A

| Size Inches | Capa- city Tons | Distance Between Parallel Bars Inches | Extreme Distance Between Ram and Head-Bl'ck Feet | Diame- ter of Ram Inches | Travel of Ram Inches | Maximum Working Pressure per Square Inch Pounds | Size Steel Parallel Bars Inches | Size Tight and Loose Pulleys Inches | Speed of Pul- leys | Weight Pounds |
|----------------|-----------------------|---|---|-----------------------------------|-------------------------------|--|---|---|-----------------------------|------------------|
| 33 | 50 | 33 | 81/2 | 61/2 | 15 | 3000 | 1½x5 | 31/2x24 | 125 | 4000 |
| 33 | 100 | 33 | 81/2 | 91/2 | 15 | 3000 | 11/2x5 | 31/2x24 | 125 | 4500 |
| 38 | 150 | 38 | 81/2 | 91/2 | 18 | 5000 | 2 x6 | 4 x18 | 400 | 7500 |
| 38 | 200 | 38 | 81/2 | 101/2 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 8500 |
| 38 | 250 | 38 | 81/2 | 111/2 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 9500 |
| 48 | 150 | 48 | 81/2 | 91/2 | 18 | 5000 | 2 x6 | 4 x18 | 400 | 10000 |
| 48 | 200 | 48 | 81/2 | 101/2 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 11000 |
| 48 | 250 | 48 | 81/2 | 111/2 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 12000 |
| 48 | 300 | 48 | 81/2 | 1212 | 18 | 5000 | 21/287 | 4 x18 | 400 | 13000 |
| 58 | 150 | 58 | 81/2 | 91/2 | 18 | 5000 | 2 x6 | 4 x18 | 400 | 10500 |
| 58 | 200 | 58 | $\frac{81_{2}}{81_{2}}$ | 101/2 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 11500 |
| 58 | 250 | 58 | 81/2 | 1116 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 13000 |
| 58 | 300 | 58 | 81/2 | 121/2 | 18 | 5000 | 21/5x7 | 4 x18 | 400 | 15000 |
| 68 | 200 | 68 | 81/2 | 101% | 18 | 5000 | 214x7 | 4 x18 | 400 | 14000 |
| 68 | 250 | 68 | 81/2 | 111/2 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 15000 |
| 68 | 300 | 68 | 81/2 | 121/2 | 18 | 5000 | 21/2x7 | 4 x18 | 400 | 16000 |
| 68 | 350 | 68 | 81/2 | 131% | 18 | 5000 | $\frac{21}{2}x7$ $\frac{21}{4}x7$ | 4 x18 | 400 | 17000 |
| 76 | 200 | 76 | 812 | 1012 | 18 | 5000 | 21/x7 | 4 x18 | 400 | 18000 |
| 76 | 250 | 76 | 81/2 | 111/2 | 18 | 5000 | $2\frac{1}{4}x7$ | 4 x18 | 400 | 20000 |
| 76 | 300 | 76 | 81/2 | 1212 | 18 | 5000 | 21/2x7 | 4 x18 | 400 | 22000 |
| 76 | 350 | 76 | 813 | 131% | 18 | 5000 | 21/2x7 | 4 x18 | 400 | 24000 |
| 88 | 300 | 88 | 81/2 | 121/2 | 24 | 5000 | 21/2x8 | 6 x24 | 400 | 26000 |
| 88 | 400 | 88 | 812 | 1412 | 24 | 5000 | 3 x8 | 6 x24 | 400 | 31000 |
| 100 | 300 | 100 | 81/2 | 121/2 | 24 | 5000 | $2\frac{1}{2}x8$ | 6 x24 | 400 | 32000 |
| 100 | 400 | 100 | 81/2 | 1415 | 24 | 5000 | 3 x8 | 6 x24 | 400 | 36000 |
| 38 | 300 | 38 | 813 | 1215 | 18 | 5000 | 21/2x7 | 4 x18 | 400 | 10500 |
| 48 | 400 | 48 | 81 ½ 81 ½ | 1415 | 18 | 5000 | 3 x8 | 4 x18 | 400 | 16000 |
| 62 | 400 | 62 | 81/2 | 16 | 26 | 5000 | 31/4×9 | 4 x26 | 400 | 30000 |
| 110 | 300 | 110 | 81/2 | 1216 | 24 | 5000 | 21/2×8 | 6 x24 | 400 | 36000 |

SENSITIVE DRILL PRESSES



| Number | 0 | 1 |
|--|-------------------------------|--------------|
| Greatest Distance Spindle to Tableinches | $-7\frac{1}{6}$ | 716 |
| Vertical Movement of Spindle " | $2i_2^2$ | 21% |
| " " Table " | - ´ 7 ² | 7 |
| Diameter of Table | 8 | 8 |
| Center of Spindle to Frame " | 51_{d} | 51/2 |
| Drilling Capacity " | 0 to 54 | 5½ 0 to ½ |
| Size of Tight and Loose Pulleys " | 11/3 x 4" | 11/3 x 4 |
| Speed " " "rev, per min. | 550 | 550 |
| Weight, Netpounds | 45 | 50 |
| "Crated" " | 60 | 65 |
| Price each | 18.00 | 22.00 |

The No. 0 and No. 1 Sensitive Drill Presses have Double Flange Top Cone, Ball Bearing Thrust and Screw adjustment to stop. The Spindle and quill are both ground to size and all parts interchangeable. They have attached countershaft and Taper adjusted to fit No. 2 Almond, Skinner or Jacobs Chucks.

DRILL PRESSES

INDEPENDENTLY CONNECTED
25-Inch Driven by 2 H. P. C. E. Motor



Pig. 2269A

22-INCH—COMPLETE
With Back Gears, Power Feed
and Automatic Stop



20-INCH—PLAIN Round Base



Other styles furnished as follows:

20-inch, with Back Gears only.

20-inch, with Power Feed and Automatic Stop.

20-inch, with Back Gears, Power Feed and Automatic Stop.

All have Wheel and Lever Feed and Quick Return to Spindle.

Round or Square Base furnished as wanted.

22-inch, complete.

Also furnished in the following styles: 22-inch Plain, 22-inch with Back Gears only, 22-inch with Power Feed and Automatic Stop.

Square Base, Wheel and Lever Feed, and Quick Return to Spindle provided with all styles.

Fig. 22690

We can furnish any style or make.

Prices and descriptive matter on application.

DRILL PRESSES

32-INCH UPRIGHT REGULAR PATTERN 82-INCH UPRIGHT
WITH FRICTION-GEARED TAPPING
ATTACHMENT



Pig. 2270A



Fig. 2270B

Sliding Head, Quick Return, Back Gears, Geared Power Feed, Automatic Stop, etc. This style furnished in 24, 28, 32, 36, and 42-inch swing.

Furnished in 24, 28, 32, 36, and 42-inch swing.

We can furnish any style or make. Prices and description mailed on application.

AMERICAN PLAIN RADIAL DRILLS

BACK GEARED, HIGH SPEED

BUILT WITH CONE PULLEY, SPEED BOX OR FOR BELT OR MOTOR DRIVE

2-FOOT

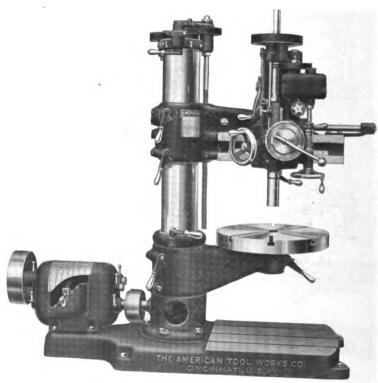


Fig. 6013A

| Size of Drillfeet | 2 | 21/2 | 3 | 31/2 |
|--|------------|-----------------|-----------|-----------|
| Drills to Center of Circle on Base, outside of columninches | 49 | 60 | 72 | 84 |
| Greatest distance from Spindle to Base | 49 | 51 | 51 | 51 |
| Size of Table Surface " | 24 | 16x26 | 16x26 | 16x32 |
| Fraverse of Spindle " | 11 | 12 | 12 | 12 |
| " " Head on Arm " | 16 | $21\frac{3}{4}$ | 27% | 333/4 |
| Spindle Speedsnumber | 16 | 16 | 16 | 16 |
| "r. p. m. | 33% to 400 | 26 to 362 | 26 to 362 | 26 to 362 |

Description on following page.

AMERICAN PLAIN RADIAL DRILLS

BACK GEARED, HIGH SPEED

BUILT WITH CONE PULLEY, SPEED BOX, OR MOTOR DRIVE

214. 3 AND 314-FOOT

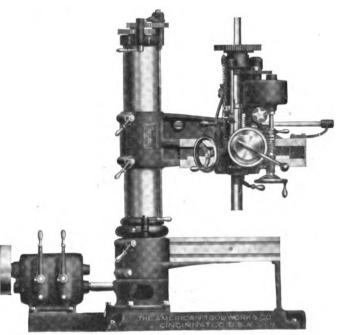


Fig. 6014A

"American" Radial Drills are built especially for rapid and accurate work, and are continually replacing the larger sizes of Upright Drills, over which they have innumerable advantages.

ROUND COLUMN is adapted because of its superior rigidity, also that arm may be swung in a complete circle.

Positive Geared Feed provides four changes from .007" to .020" by turning the star knob shown.

DEPTH GAUGE, AUTOMATIC TRIP and SAFETY STOP to spindle are built in machine. SPINDLE SPEEDS are manipulated with absolutely No SHOCK to the machine.

TAPPING MECHANISM is regularly furnished, and controlled by convenient lever on head.

Speed Box, shown above, is powerful, of the geared friction type and provides four speeds, instantly obtainable by the two levers shown. Construction is very simple. There is absolutely No Shock when engaging any speed.

Swinging Table. We direct particular attention to the convenient and time saving features of the swinging table as compared with that on base, as applied to the smaller sizes of Radial Drills.

REGULAR EQUIPMENT includes swinging table and double friction countershaft. No wrenches are required.

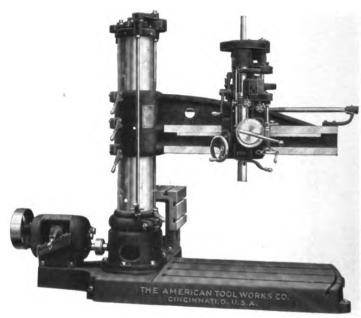
At extra cost, can be furnished, 4-speed box, 6-speed box motor drive, worm swiveling or round table for 2½, 3, 3, and 3½, drills, also special bases.

Dimensions on preceding page.

AMERICAN PLAIN RADIAL DRILLS

TRIPLE GEARED, HIGH SPEED

BUILT WITH CONE PULLEY, 4 OR 8 SPEED BOX FOR BELT OR MOTOR DRIVE
4. 5. 6 AND 7-POOT



Pig. 6015A

| Size of Drillfeet | 4 | 5 | 6 | 7 - |
|---|----------------------|----------------------|----------------------|------------------------|
| Drills to Center of Circle on Base outside of Columninches | 971/2 | 120 | 144 | 168 |
| Greatest Distance from Spindle to Base " Size of Table Top" | 58½ 20 x 20 15 | 60% 24 x 24 18 | 73½ 28 x 28 20 | 731/4 28 x 28 20 |
| Traverse of Spindle | 4014 | 513/8 | 64 | 76 |
| Spindle Speeds number " " r. p. m. | 24 18 to 355 | 24 15.4 to 305 | 24 12 to 270 | 24 12 to 27 |

"American" Triple Geared High Speed Radial Drills are noted for their enormous power and productive capacity.

Regularly equipped with eight rates of positive geared feeds from .0066" to .063", on the 4 ft. and 5 ft. and from .005" to .05" on the 6 ft. and 7 ft. depth gauge, automatic trip and safety stop to spindle, tapping mechanism, plain box table, double friction countershaft and cone pulley drive.

At an extra cost, can be furnished, 4-speed box and 8-speed box shown above, universal table, motor drive and special bases.



AMERICAN UNIVERSAL RADIAL DRILLS

HALF AND FULL UNIVERSAL ARMS

RUILT WITH CONE PULLEY AND SPEED BOX FOR BELT OR MOTOR DRIVE

4. 5. 6 AND 7-FOOT

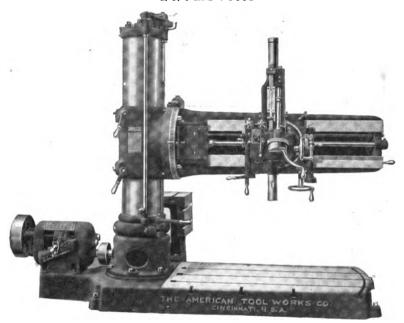


Fig 6016A

| Size of Drillfeet | 5 | 6 | 7 |
|--|---|--|--|
| Drills to Center of Circle on Base Outside of Column | 1253/4 631/2 24x24 18 361/2 24 | 147 76½ 28x28 20 48 24 19 to 314 | 182 76¼ 28x28 20 60 24 19 to 314 |

[&]quot;American" Universal Radial Drills are extremely rigid, powerful and convenient to operate.

Swiveling arm and head are graduated in degrees, which permits drilling at angles. Regularly equipped with eight rates of positive geared feed from .004" to .06", tapping mechanism, plain box table, double friction countershaft, cone pulley drive and wrenches.

At extra cost, can be furnished, 8-speed box shown above, 4 speed box, universal table, motor drive and special bases.

14. 16. AND 18-INCH

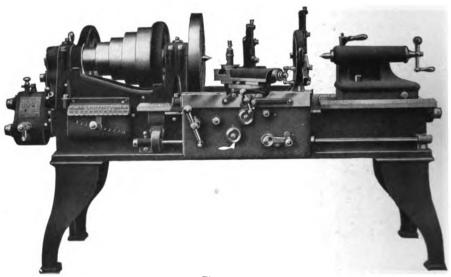


Fig. 5998A

| Base Size, advancing by even Lengths of Bed to any Length | 14 in. x 6 ft. | 16 in. x 6 ft. | 18 in. x 6 ft |
|---|-------------------|------------------|---------------|
| Actual Swing over Shearsinches | 151/4 | 181/2 | 2016 |
| Swing over Carriage Bridge " | 91/2 | 12¼ 3 ft. | 1314 |
| Takes between Centers, extreme | 9½ 3 ft. 4 in. | 3 ft. | 2 ft. 6 in. |
| Feeds | 8 to 128 | 8 to 128 | 8 to 128 |
| Threads | 4 to 64 | 2 to 32 | 2 to 32 |
| Hole in Spindleinches | 119 | $1\frac{19}{64}$ | 11% |

These Lathes are adapted to the use of high speed steels and are noted for their

power, accuracy, simplicity, productive capacity and durability.

Rapid Change Gear Mechanism gives 44 changes for feeding and screw cutting, including 11½ pipe threads, without the removal of a single gear.

Bed is of deep section, drop V pattern, giving great additional swing, and is thoroughly braced internally by heavy cross girths.

Headstock has a five-step cone pulley. The large spindle is accurately ground, running in massive phosphor bronze journals.

Tailstock is of set-over type for turning tapers and has graduated spindle.

Carriage is very heavy and is gibbed to bed its entire length.

Apron is tongued and grooved to carriage. Length and cross feeds, also feed reverse, are operated from the front. Reverse is accomplished through tumbler plate, bevel pinion never being thrown out of mesh. Steel Gears are used where necessary. Lead screw and feed rod cannot be engaged simultaneously.

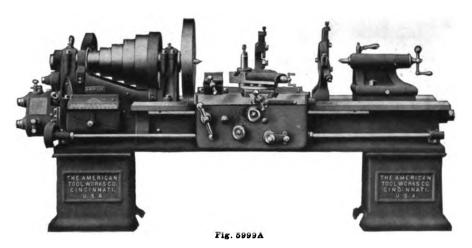
Compound Rest has full length taper gibs, with end screw adjustment. Swivel is

graduated and top slide and cross feed screws have micrometer dials.

Regular equipment, on which base price is determined, includes, compound, steady and follow rests, large and small face plates, double friction countershaft and wrenches.

When specified and at extra cost, these lathes can be equipped with taper attachment, "patented" geared headstock, double back geared headstock, pan, turret on shears, turret on carriage, friction head, draw-in attachment with collets, chucks, electric motor drive, automatic stop and a device for securing coarser or finer threads and feeds than regularly furnished.

20 AND 24-INCH



| Base Size, advancing by even Lengths of Bed to any Length. | 20-in. x 8 ft. | 24-in. x 8 ft. |
|--|----------------|----------------|
| Actual Swing over Shears,inches | 221/2 | 241/2 |
| Swing over Carriage Bridge " | 145% | 171/2 |
| Takes Between Centers, extreme | 4 ft. 1 in. | 4 ft. 1 in. |
| Feeds | 8.8 to 140 | 8.8 to 140 |
| Threads | 2 to 32 | 2 to 32 |
| Hole in Spindleinches | 1% | 21/8 |

These Lathes are adapted to the use of high speed steels and are noted for their

power, accuracy, simplicity, productive capacity and durability.

Rapid Change Gear Mechanism gives 44 changes for feeding

Rapid Change Gear Mechanism gives 44 changes for feeding and screw cutting, including 11½ pipe threads, without the removal of a single gear. All gears in this mechanism are STEEL.

Bed is of deep section, drop V pattern, giving additional swing, and is thoroughly braced internally by heavy cross girths.

Headstock has a five-step cone pulley. The large spindle is accurately ground,

running in massive phosphor bronze journals.

Tailstock is of set-over type for turning tapers and has graduated spindle.

Carriage is very heavy and is gibbed to bed its entire length.

Apron is tongued and grooved to carriage. Length and cross feeds, also feed reverse, are operated from the front. Reverse is accomplished through tumbler plate, bevel pinion never being thrown out of mesh. All gears in apron are STEEL. Lead Screw and Feed Rod cannot be engaged simultaneously.

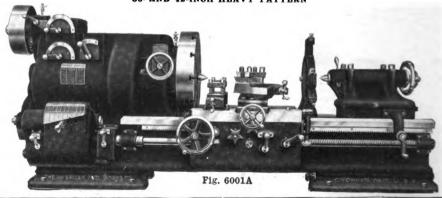
Compound Rest has full length Taper Gibs, with end screw adjustment. Swivel is

graduated and top slide and cross feed screws have micrometer dials.

Regular Equipment, on which base price is determined, includes compound, full swing, steady and follow rests, large and small face plates, double friction countershaft and wrenches.

When Specified, and at extra cost, these lathes can be equipped with taper attachment, "patented" geared headstock, double back geared headstock, pan, turret on shears, turret on carriage, friction head, draw-in attachment with collets, chucks, electric motor drive, automatic stop and a device for securing coarser or finer threads and feeds than regularly furnished.

AMERICAN LATHES 36- AND 42-INCH HEAVY PATTERN



| Base Size, advancing by even Lengths of Bed to any Length | 36 in. x 12 ft. | 42 in. x 12 ft. |
|---|-----------------|-----------------|
| Actual Swing over Shearsinches | | 44 |
| Swing over Compound Rest Slide " | 227/8 | 301/8 |
| Takes between Centersfeet | *4 | *4 |
| Feeds per inch, 48 Changes | 4 to 224 | 4 to 224 |
| Threads per inch, 48 Changes | 1/2 to 28 | 1/2 to 28 |
| Hole in Spindleinches | 25/8 | 25/8 |

* Cone drive 5 ft.

These Lathes are adapted to the use of high speed steels and are noted for their

power, accuracy, simplicity, productive capacity and durability.

Improved Quick Change Gear Mechanism gives a wide range of changes for feeding and screw cutting, including 11½ pipe threads. The mechanism is a complete removable unit and consists of a gear box of the cone of tumbler type in which all gears are steel, and the change gears are of the Brown & Sharpe 20 degree involute, pointed tooth type. Ample provision is made for additional compounding gears on quadrant to produce special threads or feeds. Index plate shows how to obtain each thread, pitch or feed.

Bed is of deep section, drop V pattern giving additional swing. Is thoroughly braced internally and has rack cast in center for engaging pawl dropped from tailstock to insure against slippage.

Headstock is very heavy, triple geared, and is the patented geared head. Face Plate is internally geared. Spindle is accurately ground and runs in massive phosphor-bronze journals.

Tailstock is of set-over type for turning tapers and has graduated spindle. It is moved along the bed by crank and gears. Has pawl engaging rack cast in center of bed, to prevent slippage. Improved clamping device for spindle does not necessitate slitting the barrel.

Carriage is very heavy and is gibbed to bed its entire length. Chasing dial for

catching lead screw is supplied.

Apron is tongued, grooved and bolted to carriage its entire length. Is "double", giving all shafts a double bearing. Length and cross feed, also feed reverse, are operated from the front. Reverse is accomplished through double bevel pinion. All gears in apron are STEEL.

Compound Rest has full length Taper Gibs with end screw adjustment. Swivel is graduated. Top slide has power angular feed. Top slide screw has micrometer dial.

Regular Equipment, on which base price is determined, includes 4-step cone triple geared headstock, compound, steady rest and full swing rest, quick change gears, double friction countershaft and wrenches.

When specified and at an extra cost, these lathes can be equipped with taper attachment "patented" geared headstock, electric motor drive, turret on shears, and triple friction countershaft, finer or coarser thread range or special feeds.

DOUBLE BACK GEARED

14 TO 36-INCH. INCLUSIVE

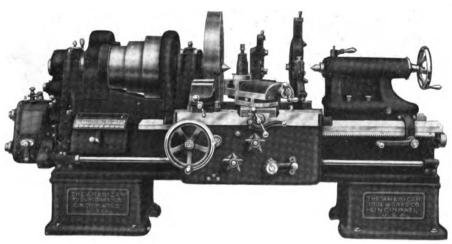


Fig. 6002A

To meet the demands for lathes with different types of headstocks, due to the rapid development in modern shop practice, "American" lathes can be equipped with several types of heads, among which is the Double Back Geared, herewith illustrated and briefly described.

Double Back Geared Headstock furnished on above sizes, is of heavy and substantial construction. It carries a three step cone pulley having extra wide faces with steps of large diameter. Greater power is therefore available, on account of the extra belt surface, than can be secured from the same size regular headstock.

Series of Spindle Speeds afforded, are nicely graded for a wide range of work. They advance in geometrical progression and are particularly valuable for manufacturing purposes.

Double Back Gears are quickly and easily manipulated through a convenient eccentric lever. A Retainer automatically locates and secures them in the position as set. All gears are neatly and substantially covered to afford protection.

Back Gear Pinion is cut integral with steel sleeve, which is bushed with bronze. Thorough lubrication of headstock is secured by special means, minimizing attention to it.

When Specified, and at extra cost, a triple friction countershaft can be furnished. For Detailed Information as to other regular features of "American" Lathes, see individual pages or circulars describing same.

"PATENTED" GEARED HEAD

14 TO 48-INCH, INCLUSIVE

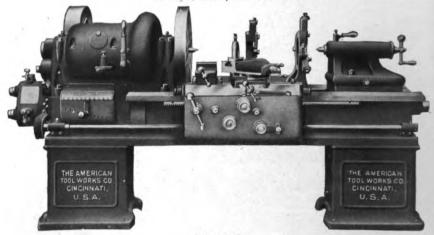


Fig. 6004A

The preference for Lathes equipped with means for mechanical speed changes, instead of the cone pulley, and for a head which will deliver an enormous amount of power at the cutting tool, we offer the "American" Lathe with "Patented" Geared Head as above illustration, which shows the 20-inch size.

The Headstock is a complete unit and extremely simple in construction, only six (6) gears being required for four (4) fundamental speed changes, which are obtained through two levers at the front. The gears are of coarse pitch and wide face, and the gear ratio is approximately three times as high as the ordinary lathe head. Changes in speed may be made while the machine is running, and the index plate shows how to obtain the desired speed. There are no slip gears, hollow shafts, tumbler gears, complicated, delicate or frail parts, but, throughout, it is extremely simple, powerful and durable.

The Driving Pulley is mounted on the driving shaft, at Back of Head, so placed that the belt may be removed without unlacing. This location permits of any reasonable diameter and widths of face to suit different conditions. The average belt width for the 20-inch lathe, shown above, is 6 inches. Belt power and driving speed are constant for each countershaft speed.

Spindle is of special steel, large diameter, running in massive phosphor-bronze journals, and is relieved of all belt strain, since the driving pulley is mounted on back shaft.

Power delivered through this head is enormous. The high gear ratio, together with the enormous belt contact, delivers power sufficient to take the heaviest cuts with high-speed steels.

Electric Motor Drive. This lathe may be readily converted into a motor-driven machine at any time after installation, by placing motor on a flat surface, planed on top of head, and connecting motor to driving shaft of head through chain or spur gearing. This flat surface is planed on all these heads before leaving the shops, to make easy the application of an electric motor at any time.

Regular Equipment for belt drive, upon which base price is determined, includes a triple-friction countershaft.

triple-iriction countersnar

Regular Features of "American" Lathes are furnished with this type of head-stock,

according to the size of the lathe.

Geared Head may be applied to any "American" Lathe, those furnished on 36-inch Heavy Pattern to 48-inch, being of slightly different design from illustration, owing to the geared face-plate drive.

ELECTRIC MOTOR DRIVEN

14 TO 48-INCH INCLUSIVE

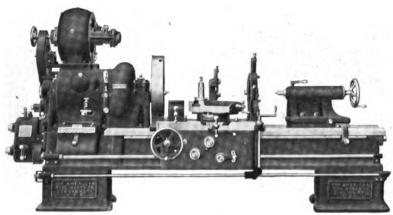


Fig. 6005A

The "American" method of motor application to machine tools is by far the most thoroughly satisfactory yet developed. To secure the proper spindle speeds for an electrically driven lathe, the most practical and economical method is to supplement fundamental mechanical speed changes with electrical changes, advancing or receding by small increments at the will of the operator, through a motor controller handle conveniently located.

The "American" Motor Driven Lathe is equipped with a geared headstock, which affords four (4) mechanical speed changes with only six (6) gears, through the manipulation of two levers at the front, as described on the preceding page. An electric motor of any style, (preferably one having a 2 to 1 speed variation) is mounted on the headstock and connected to the main driving shaft through spur gears.

The mechanical Speed Changes in the headstock, being supplemented by the electrical changes obtained through the motor, thus afford a very wide range of speeds covering all usual requirements. The number of speeds obtainable, are four (4) times the number of working buttons on the electrical controller in that direction.

The Controller Handle is placed on the right end of the carriage, where it is always convenient to the hand of the operator for starting, stopping, reversing or varying the motor speeds.

The Flexibility of this construction is readily apparent, inasmuch as any "American" Geared Head Lathe can be easily converted into a motor driven lathe at any time after its installation, and further, should the motor become disabled, the lathe may be driven by a belt from the countershaft or another motor conveniently placed. Constant use of the machine, at all times, is thereby insured.

We have no preference as to the make of motor, but prefer to designate the "speeds" of same for each individual machine.

Regular features of "American" Lathes are furnished according to the size of the lathe and its equipment.

SENECA FALLS SPEED LATHES

10 AND 12-INCH

5-FOOT BEDS

STYLE C



Fig. 6151A

STYLE P



Fig. 6151B

| Size Latheinches | 10 | 12 |
|--|-------------------|----------------|
| Hole in Head Spindleinches | 7/8 | 21 32 |
| Diameter of Spindle Nose " | 17/6 | 1% |
| Front Bearings of Spindle " | 17/6 x 25/8 | 17/6 x 31/8 |
| Back " " " " | 15/6 x 17/8 | 1% x 2% |
| Diameter of Tail " " | 1 | 11/4 |
| Swing Over Bed, Actual " | 11 | 13 |
| " " Rests " | 7 | 81/2 |
| Size Pulleys on Countershaft | 5 x 15/8 | 6 x 2 |
| Diameter Cone Pulleys " | 5 21/8, 31/4, | 5 21/2, 4 1 |
| Diameter Cone runeys | 1 43/8 and 51/2 5 | 1 51/2 and 7 5 |
| Belt " | 11/4 | 11/2 |
| Speed of Countershaft revolutions per minute | 400 | 400 |
| Thread on Spindle Noseper inch | 12 | 10 |
| Weight 5-foot Bed with Countershaftpounds | 305 | 475 |
| " " Foot Power " | 390 | 550 |

The Patented Foot-Power by which the operator can obtain more leverage and produce greater power with less fatigue than any other kind in use, consists of double treadles with a walking motion.

Note—12-inch Lathes do not have Lever Feed on Tail Stock, but are furnished with Screw Feed.

Prices on application.



STAR SCREW CUTTING LATHES

9 AND 11-INCH

STYLE E



Fig. 6152A

| Size Latheinches | 10-9 | 30-11 |
|---|------------------|--------------|
| Hole in Head Spindleinches | 7/6 | 1 |
| Diameter of Spindle Nose " | 17% | 1% |
| Front Bearing of Spindle " | 176 x 234 | 1% x 31/4 |
| Back " " " " | 15% x 134 | 176 x 21/8 |
| Diameter of Tail Spindle " | 11/2 | 13% |
| Swing over Bed, Actual | 101% | 121% |
| " " Rests " | 57% | 71/2 |
| Compound Rest Travels | 37% | 41/ |
| Capacity Center Rest | 3 | 35% |
| Belt | 11/ | 11/2 |
| Diameters Cone Pulleys " | 33/6, 45/6, 57/6 | 314. 416.534 |
| Countershaft " " | 6 x 13/ | 8 x 21/4 |
| Floor Space | 25 x 53 | 27 x 72 |
| Speed of Countershaftrevolutions per minute | 200 | 200 |
| Back Gearingratio | 7 to 1 | 8.5 to 1 |
| Weight with Countershaftpounds | 385 | 670 |
| " "Foot Power | 440 | 730 |

Prices on application.

AMERICAN PLANERS

24-INCH HEAVY PATTERN—26, 28 AND 30-INCH
With One or Two Heads on Cross Rail

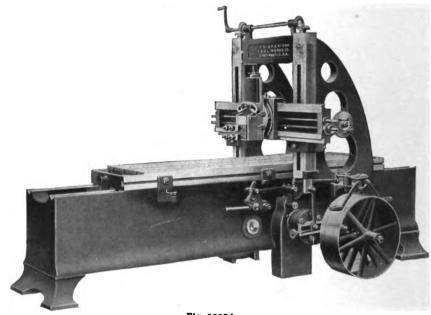


Fig. 5997A

| Base Size advancing by even Lengths of Table to any Length. | 24 in. x 6 ft. | 26 in. x 6 ft. | 28 in. x 6 ft | 30 in x 6 ft |
|---|----------------|----------------|---------------|--------------|
| Planes wideinches | | 261/2 | 281/2 | 301/2 |
| " high" | 241/2 | 261/2 | 2812 | 3016 |
| Length of Bed for 6-foot Tablefeet | 10 | 10° | 10 | °Ò2 |
| Countershaft Pulleysinches | 12x4½ | 12x41/2 | 12x41/2 | 12x416 |
| Speed of Countershaft rev. per min. | 425 | 425 | 425 | 425 |

These Planers are powerful, rigid and adapted to the use of high speed steels.

Bed is of the deep, square end type, extra wide, thoroughly braced internally, and unusually long. All driving shaft bearings are bored and reamed, the bushings ground and driven into place. V's have automatic roll oilers, pockets at both ends catching all waste oil.

Table has dirt proof feature and improved shifting mechanism, which prevents shricking of belts. Table can be run from under the tool for examination of work. A safety locking device prevents table starting of itself. Stop holes at extreme ends allow clamping of work longer than that specified.

Crossrail is of wide box section. Is raised and lowered by hand.

Heads have power feed in all directions and hand feed at either side of machine. Have micrometer adjustment. Saddles are graduated in degrees. Feed rack is steel. When two heads are ordered, rail is made extra long so that each head can plane the full width of the machine. Feeds of each head are independent.

Regular equipment includes one head, countershaft with tight and loose pulleys and wrenches.

At extra cost, can be furnished, extra rail head, motor or parallel drive, multi-speed drive, with two or four cutting speeds and accessories.

AMERICAN CRANK SHAPERS

BELT. SPEED BOX OR MOTOR DRIVE

15-INCH SINGLE GEARED



Fig. 6011A

| Rated Size | 15" Single Geared | 16" Back Geared | 20" Back Geared | 24" Back Geared | 30" Back Geared |
|--------------------------------|----------------------|--------------------|--------------------|--------------------|-----------------------------------|
| Actual Length of Stroke inches | 151/4 | 161/2 | 203/4 | 243/4 | 301/4 |
| Down Feed to Head " | 6 | 7 | 9 | 9 | 9 |
| Vertical Travel of Table " | 14 | 13 | 141/2 | 14 | 131/4 |
| Horizontal 44 -4 44 | 18 | 22 | 261/2 | | 31 |
| Cross Feed Range | .008 to .200 | .008 to. 200 | .008 to .200 | .008 to .200 | .008 to .200 |
| Keyseats under Ram | $2\frac{1}{2}$ | 3 | 31/2 | 33/4 | 33/4 |
| Countershaft Pulleys T. & L | 12x31/4 | 12x31/6 | 16x41 | 16x414 | 16x14 ¹ / ₄ |
| * Speedsr. p. m. | 400 | 250 | 190 | 190 | 210 |

These "American" Shapers are of new design, adapted to Tool Room or Manufacturing Purposes. Are very powerful and accurate to .001" the full length of table. Stroke is postive and uniform. Gear ratio and belt power utilize high speed steels to the limit.

Cross Feed is of new "patented" design, variable, automatic and may be set while running, by star knob shown. Graduations show from 1 to 25 notches, either side of

zero, each notch representing .008". Feed rack is steel.

Keyseating extra large shafts may be accomplished by setting table over to allow

shaft to pass outside of column.

Column is deep, wide, and strongly braced internally and externally to meet the heaviest strains. Has long bearing for ram.

(Description continued on following page)

AMERICAN CRANK SHAPERS

16, 20, 24 AND 30 INCH BACK GEARED, WITH EXTENSION BASE



Fig. 6012A

Base is strongly ribbed and of pan construction to catch oil drippings.

Ram is heavy, extremely rigid throughout stroke and is positioned by crank near the head, a pointer showing length of stroke set. Has Continuous Taper Gib with end screw adjustment, for taking up the wear. Has exceedingly quick return. Stroke can be changed without stopping.

Head is clamped by two bolts. Down slide has Taper Gib adjustment. Tool post

is of large size.

Table has T-slots on top and sides, cut from the solid. Is braced internally and readily detachable.

Apron is accurately fitted to rail. Has Taper Gib adjustment.

Patented Automatic Stop releases the feed and prevents breakage to the parts should tool be fed into cut or apron accidently fed to its limit in either direction on the rail.

Cross Rail is very heavy and exceptionally long with wide bearings scraped to sur-

face plates.

Telescopic Elevating Screw for cross rail eliminates the necessity of a hole in the floor for travel of screw. Is hung on ball bearings.

Vise is heavy. Jaws are faced with steel. Swivel is graduated in degrees.

Lubrication: ram slides have felt wipers at front and center with pockets at rear, where waste oil may be drawn off at will. Oil is retained in a pocket on arm from which crank pin and sliding block are lubricated.

Regular Equipment includes vise, countershaft, wrenches and table support (except

15" size).

We can equip these shapers, at extra cost, with Motor Drive, 4-speed box, circular attachment, rotating table, tilting table, swivel jaw vise, mold makers' vise and table, power down feed to head, etc.

(Dimensions on preceding page)

OESTERLEIN MILLING MACHINES

No. 24, PLAIN

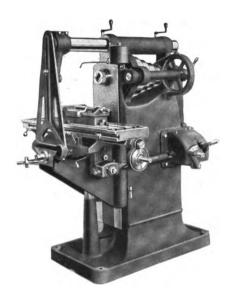


Fig. 6228A

| Length of Tableinches | 40 |
|--|---------------|
| Width of Table " | 101/3 |
| *Automatic Longitudinal Feed " | 24 |
| Transverse Movement " | 71/2 |
| Vertical " " | 18 |
| Front Journal of Spindle " | 3 |
| Back " " " " | 23/6 |
| Diameter of Arm " | 4 |
| Feed, 12 Changes, Ranging | †.006 to .230 |
| Vise Jaws " | 7x1½ open 5 |
| Countershaft Pulleys | 14x4 |
| Speed of Countershaft Pulleys revolutions per minute | 140 and 170 |
| Weightpounds | 2900 |
| " Crated for Domestic Shipment " | 3200 |

^{*}Can lengthen table to make feed 28 inches. † Per revolution of spindle.

Prices on application-

OESTERLEIN MILLING MACHINES

No. 34, PLAIN

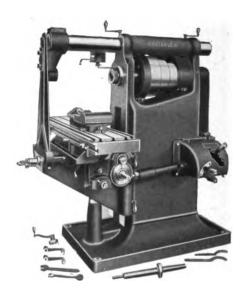


Fig. 6229A

| Length of Tablei | nches | - 53 |
|---|---------|------------------|
| Width of Table | 11 | 121% |
| Automatic Longitudinal Feed | ** | 34 |
| Transverse Movement | 46 | 10 |
| Vertical " | 66 | 20 |
| Front Journal of Spindle | ** | 3% |
| Back " " " | ** | $2\frac{7}{16}$ |
| Diameter of Arm | " | 41/2 |
| Feed, 15 Changes, Ranging | ** | *.006 to .312 |
| Vise Jaws. | ** | 8 x 134, opens 6 |
| Countershaft Pulleys | | 16 x 4 |
| Speed of Countershaft Pulleys revolutions per | min. | 195 and 240 |
| Weightp | ounds " | 3800 4100 |

^{*}One revolution of spindle.

Prices on application.

OSTERLEIN MILLING MACHINES

No. 30, UNIVERSAL

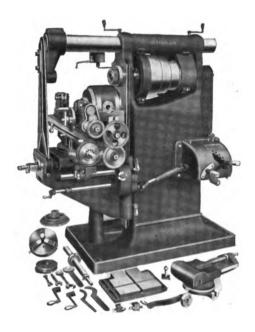


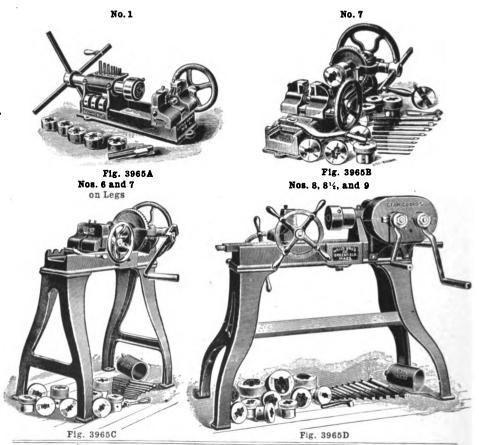
Fig. 6232A

| Length of Tableinches | 48 |
|---|----------------|
| Width of Table " | 10 |
| Automatic Longitudinal Feed " | 30 |
| " Transverse Feed " | 10 |
| " Vertical Feed" | 19 |
| Front Journal of Spindle | 394 |
| Back " " " | $2J_{\pi}^{0}$ |
| Diameter of Arm | 41% |
| Feed, 15 Changes, Ranging | *.006 to .312 |
| Countershaft Pulleys " | 16x4 |
| Speed of Countershaft Pulleysrevolutions per minute | 195 and 240 |
| Weightpounds | 3900 |
| " C.ated for Domestic Shipment " | 4200 |

^{*}One revolution of spindle.

Prices on application.

LITTLE GIANT **BOLT CUTTERS AND NUT TAPPERS**



| Number | Range, Inches | Weight Pounds | Price Each |
|-----------|--|------------------|---------------|
| 1 A | 14, 5/6, 3/8, 7/6, 1/2, 5/8, 3/4 | 126 | 30.00 |
| 1 B | 14, 5/6, 3/8, 7/6, 1/2, 5/8, 3/4, 7/8, and 1 | 126 | 40.00 |
| 6 | 14, 16, 18, 16, 12, 58, 34 | 200 | 50.00 |
| 7 | 1/4, 1/6, 1/8, 1/6, 1/2, 5/8, 3/4, 7/8, and 1 | 265 | 70.00 |
| 6 on Legs | 14, 5/6, 3/8, 7/6, 1/2, 5/8, 3/4 | 250 | 57.00 |
| 7 " " | 14, %6, 38, %6, 12, 58, 34, %, and 1 | 335 | 77.00 |
| 8 | 14, 5/6, 3/8, 7/6, 1/2, 5/8, 3/4, 5/8, and 1 | 290 | 100.00 |
| 81/2 | $\frac{1}{4}, \frac{5}{16}, \frac{3}{8}, \frac{7}{16}, \frac{1}{2}, \frac{5}{8}, \frac{3}{4}, \frac{7}{8}, \frac{1}{1}, \frac{11}{8}, \frac{11}{4}$ | 525 | 118.00 |
| 9 | $\frac{3}{8}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$, $\frac{1}{1}$, $\frac{11}{8}$, $\frac{11}{4}$, $\frac{13}{8}$, $\frac{11}{2}$ | | 140.00 |

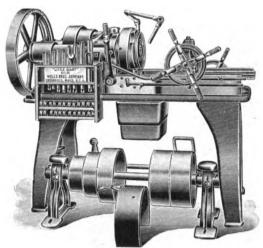
Machines furnished complete with Tap Chuck, Taps, Dies, and Collets.

No. 7 has improved clutch on spindle for running die off after thread is cut, making quick return.

Nos. 8, 81/2, and 9 have improved tail block jaws, for holding iron; also clutch on spindle for throwing out gear. Balance wheel on end of spindle, 5.00 extra.

LITTLE GIANT AUTOMATIC OPENING DIE BOLT CUTTERS AND NUT TAPPERS

Nos. 32, 34 AND 36



F1g. 6690A

| Number | 32 | 34 | 36 |
|---|---------------|--------------------------------|-----------------|
| Cuts up toinches | 1 | 11/2 | 2 |
| Size Driving Pulley " | 10x3 | 12x4 | 14x4 |
| " Cone Pulley " | 3x6, 8 and 10 | $0.3\frac{1}{2}$ x8, 10 and 12 | 4x10, 12 and 14 |
| Geared | 5 to 1 | 8 to 1 | 12 to 1 |
| Revolutions per minute | 250 | 300 | 300 |
| Floor Spaceinches | 52x24 | 58x30 | 66x32 |
| Weightpounds | 850 | 1250 | 1600 |
| Price, with Friction Countershaft each | 190.00 | 250.00 | 335.00 |
| " " Plain Countershaft " | 180.00 | 240.00 | 325.00 |
| " without Countershaft " | 165.00 | 225.00 | 300.00 |
| " Set of R. H. Pipe Dies, 1/8, 1/4, 3/5, 1/2, 3/4, 1 extra " " 1/4, 3/8, 1/2, 1, 11/4, 11/2, 2 " | 15.00 | | |
| " " " " " $\frac{1}{4},\frac{3}{8},\frac{1}{2},\frac{1}{1},\frac{1}{4},\frac{1}{2},\frac{1}{2}$ " | | 24.00 | 32.00 |
| " Single Diesper set | 2.50 | 3.00 | 4.00 |

U. S. S. threads are furnished unless otherwise specified.

CUTTING SIZES, NUT TAPS

Each machine furnished with oil pump and tank, gear guards, die head tap holding jaws and dies and machine nut taps as above.

[&]quot;V" form exact size or oversize or Whitworth Standard threads furnished when specified at same price.

KEY-SEATING MACHINES

No. 1

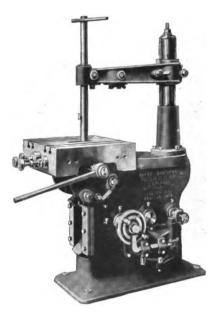


Fig. 6136A

| Extreme Length of Stroke | | 1. |
|--|--------|----------|
| Working Length of Cutter | inches | 1: |
| Distance from Cutter Bar to Column in Outside Position | | 2 |
| Length of Table | " | 2 |
| Width " " | " | 2 |
| Longitudinal Movement of Table | - 66 | 43 |
| Diameter of Column | " | 43 43 |
| Floor Space | | 35x4 |
| Size of Tight and Loose Pulleys on Countershaft | " | 16x |
| " " Driving Pulley on Machine | " | 16x4 |
| " "Reverse " " " | | 12x4 |
| Speed of Countershaftrevolutions per r | ninute | 18 |
| Weight Complete | ounds | 240 |

The table of this machine tilts in either direction and has a micrometer depth screw for regulating depth of key-seats. Work up to 42 inches in diameter can be chucked with the column in the outside position and by changing same to another position, any diameter can be handled. Will cut key-seats up to 1½ inches wide.

Regular equipment includes the following: flat centering plate for centering bushings; V shaped centering plate for centering work by the outside; three short centering bushings, 1%, 1% and 2% inches in diameter; clamping bar; pair clamping bolts; three cutter bars with guide-bars, hand levers, upper and lower bushings to match; ten cutters; pair extension arms, countershaft and all necessary wrenches.

Prices and further information on application.

KEY SEATING MACHINES

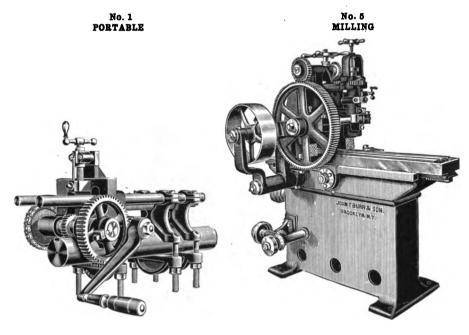


Fig. 6752A

Fig. 6752B

PORTABLE

| Number | 1 | 2 |
|---|-----------|----------|
| Will Mill Key-Seats up to Diameter inches | 5 | 8 |
| | 12 | 12 |
| " " Width " | 14 to 114 | 1/2 to 2 |
| Number of Special Cutters | 5 1 | 5 |
| Weightpounds | 76 | 200 |
| Priceeach | 40.00 | 75.00 |

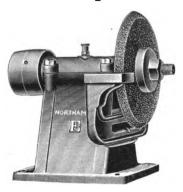
MILLING

| Number | 3 | 5 |
|--|------------------------------------|-------------------------------------|
| Width of Plateninches | 63/4 | 9 |
| Length " " " | 36 | 48 |
| Diameter of Spindle " | 21/4 | 3 |
| Greatest Distance from Center of Spindle to Platen " | 81/2 | 111/2 |
| Least " " " " " " " | 134 | 11/8 |
| Will take, through Housing " | $7\frac{3}{8} \times 7\frac{3}{8}$ | $10\frac{3}{8} \times 9\frac{3}{8}$ |
| Number of Feed Changes | 8 | 8 |
| Main Driving Gearinches | 15 x 2 | $20 \times 2\frac{1}{2}$ |
| Driving Pulley " | $12 \times 3\frac{1}{2}$ | 14 x 41/4 |
| Countershaft Pulleys " | 12 x 33/4 | ••••• |
| Speed of Countershaft Pulleys revolutions per minute | 175 | |
| Weightpounds | 1600 | 2800 |
| Priceeach | 300.00 | 400.00 |

No. 3 is also made with 48 and 60-inch length platens. No. 5 with 60 and 72-inch.

EMERY WHEEL AND BENCH WATERTOOL GRINDERS

EMERY WHEEL GRINDERS



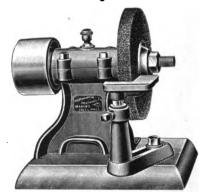


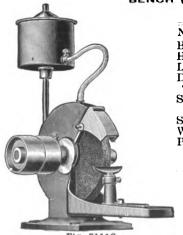
Fig. 7111A

Fig. 7111B

| Machine | E | 0 |
|-------------------------------------|---------------|----------|
| Bench Room Occupiedinches | 7 x 8 | 8 x 12 |
| Height to Center of Arbor " | 7 | 81/4 |
| Length of Bearing " | 6 | 5 |
| Diameter of Arbor through Bearing " | 7/8 | 1 |
| " " between Flanges " | 3/4 | 3/4 |
| " " Flanges | 3 | 3 |
| Size Emery Wheels " | 12×1 | 12 x 1 |
| " Pulley on Shaft" | 3 x 21/2 | 4 x 21/2 |
| Weightpounds | 25 | 40 |
| Speed of Countershaftr. p. m. | 345 | 450 |
| Price of Head onlyeach | 6.50 | 10.00 |
| " with No. 1 Countershaft" | 15.50 | 19.00 |

Emery Wheels not included in above prices.

BENCH WATERTOOL GRINDERS



| ED/DELS/ | 1000 | 100000 |
|----------|------|--------|
| Fig. | 7111 | C |

| Number | | 2 |
|---------------------------------|------------------|-------------------|
| | 0.10 | |
| Bench Room Occupiedinches | 8x10 | 10x13 |
| Height to Center of Arbor " | 8 | 10 |
| Length of Bearing " | 3 | 3¾ |
| Dia. of Arbor through Bearing " | 1 | 1 |
| " "Hole in Wheel " | 11/2 | 11/6 |
| Size of Emery Wheel " | 10x1 | $12x1\frac{1}{2}$ |
| " " T. and L. Pulleys " | $4x2\frac{1}{2}$ | 5x214 |
| Speed of Wheelr.p.m. | 1800 | 1600 |
| Weightpounds | 65 | 100 |
| Price, with Pulleyseach | 24.00 | 30.00 |
| " " Countershaft " | 33.00 | 39.00 |
| " of Cast Iron Stand " | 12.00 | 14.00 |

Emery Wheel included in above prices.

EMERY WHEEL GRINDERS

No. 1



Fig. 3485A



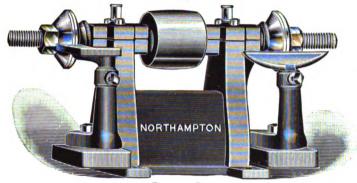


Fig. 3485B

Furnished with Crucible Steel Arbor, Dust-Proof Boxes. Our Arbors all have a square or U.S. government standard threads, as these forms maintain their shape and size best and do not wear out with changing of wheels. Late designs have self-oiling bearings.

| Number | 1 | 2 | 212 |
|--|---------------------------------|------------|--------------|
| Bench Room occupied inches | 71/2 x 71/2 | 9x9 | 11×11 |
| Distance between Wheels " | 101/2 | 131/2 | 1534 |
| Height to Center of Arbor " | 61/2 | 8 | 10 |
| Length of Bearings. " | 3 | 41/4 | 5 |
| Diameter of Arbor through Bearings " | 1 | 11/8 | 11 |
| " " between Flanges" | 3/4 | 1 | 114 |
| " "Flanges" " | 21/2 | 3 | 338 |
| Size of Emery Wheels " | 10x2 | 12x2 | 14-4 |
| " "Pulley on Arbor" " | $2\frac{3}{4}$ x $2\frac{3}{4}$ | 3½x3 55 | 414 x2 95 |
| Weight pounds | 30 | 66 | 4314 |
| Speed of Countershaft per minute revolutions | 350 | 370 | 435 |
| Price each | 14.00 | 17.00 | 20.00 |
| " with No. 1 Countershaft " | 23.00 | 27.00 | 00.00 |
| " " " 2 "" | | 27.00 | 30:00 |

Emery Wheels not included in above prices.

WATER TOOL GRINDERS

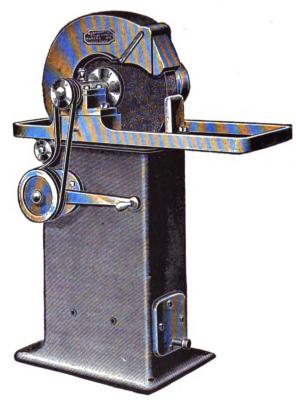


Fig. 3487A

| Number | 3 | 4 | 5 |
|---|---------|------------|----------|
| Floor Space Occupiedinches | 14 x 20 | 16 x 24 | 18 x 28 |
| Height to top of Rest | 38 | 39 | 38 |
| Length of Bearings " | 5 | 6 | 7 |
| Diamter of Arbor through Bearings" | 15% | 194 | 111/6 |
| " " between "" | 15/16 | 196 | 111/6 |
| " " Hole in Wheel " | 216 | 21% | 21/2 |
| Size of Wheel | 16 x 2 | 20 x 21/6 | 24 x 3 |
| " "Tight and Loose Pulleys" | 5 x 3 | 7 x 3 | 7 x 41/4 |
| Speed per minuterevolutions | 1200 | 900 to 950 | 850 |
| Weight pounds | 500 | 600 | 900 |
| " of Countershaft | 75 | 125 | 150 |
| Price, with Tight and Loose Pulleyseach | 90.00 | 110.00 | 160.00 |
| " Countershaft" | 100.00 | 125.00 | 185.00 |

Emery Wheels are included in above prices.

DAYTON UNIVERSAL CUTTER AND TOOL GRINDERS



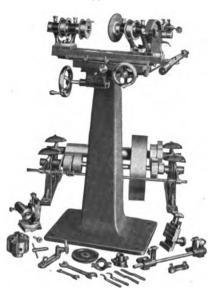


Fig. 6144A

| Distance between Centers | inches |
|--------------------------------|--------|
| Diameter Centers | |
| Taper of Table Angle per Foot | |
| Taper of Table Angle per Foot | |
| Internal Grinder Hole | |
| Length of Form Cutter Centers. | |
| Diam. " " " " | |
| Size Vise Jaws | |
| Weight | pounds |

Machines are furnished with double countershaft, universal head and tail stock with centers, dead center pulley, internal grinder head complete, compound swivel head, 4-inch reversible jaw chuck, vise, form cutter centers, index dial 21 spacing, 2 collets, $\frac{7}{8}$ and 1-inch with face plate, tooth rest and emery wheels as follows: one $6x\frac{3}{8}$ -inch, one 5-inch dish, one 5-inch cup and three internal. This machine can be furnished also in plain grinder. Prices and further information on application.

YANKEE DRILL GRINDERS

STYLE K



Fig. 433A

STYLE L



Fig 433B

STYLE K

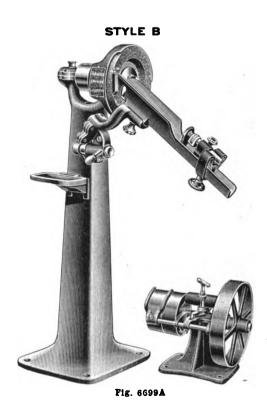
| Capacity Drillsi | nches | 3 to 11/1 |
|---------------------------------------|-------|------------------|
| Diameter of Emery Wheel | •• | 7 7 |
| Height to Center of Spindle | 44 | 14 |
| Pulley on Wheel Spindle | * } | 216x114 |
| Driving Pulley | " | 12×11 |
| Tight and Loose Pulleys | ** | 6×1^{3} |
| Speed of Emery Wheelrevolutions per m | inute | 2640 |
| " "Countershaft " " | " | 550 |
| Bench Spacesquare i | nches | 144 |
| Weight, Netpo | | 100 |
| Price | | 48.00 |

STYLE L

| Capacity Drillsinches | .040 to 54 |
|--|------------|
| Diameter of Emery Wheel " | 5 |
| Height to Center of Spindle | 14 |
| Pulley Wheel on Spindle " | 21/6x11/4 |
| Oriving Pulley " | 12 x11/4 |
| Fight and Loose Pulleys " | 6 x13 |
| Speed of Emery Wheelrevolutions per minute | 2880 |
| " " Countershaft " " " " | 600 |
| Bench Space | 144 |
| Weight, Netpounds | 95 |
| Priceeach | 46.00 |

The above prices include countershaft.

YANKEE DRILL GRINDERS



| The second secon | | |
|--|---------|--------------------------|
| Capacity Drills | | |
| Diameter of Emery Wheel | . " | 91/2 |
| Height to Center of Spindle | " | 42 |
| Pulley on Wheel Spindle | . " | 4 x 21/1 |
| Driving Pulley | . " | $12 \times 2\frac{1}{4}$ |
| Tight and Loose Pulleys | | $6 \times 2 \frac{1}{4}$ |
| Speed of Emery Wheelsrevolutions per | minute | 1600 |
| " "Countershaft " " | " | 530 |
| Floor Space | .inches | 18 x 36 |
| Weight, Net | pounds | 230 |
| Price | each | 65.00 |

The style A machine can be furnished, which is the same as style B, except the countershaft is self-contained, at same price.



FOOS GASOLINE ENGINES
DIRECT CONNECTED OUTFIT

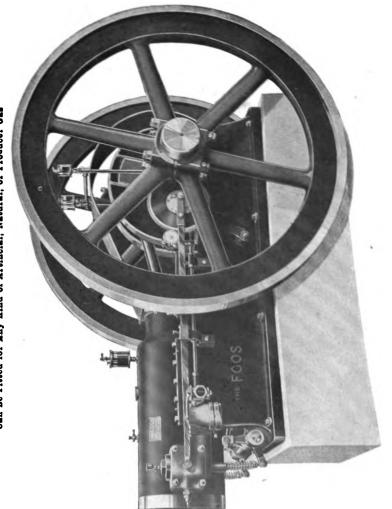
Fig. 9879A

DO NOT CUT CATALOGUE, ORDER BY FIGURE NUMBER.

Prices on application.

FOOS ENGINES

WORKING SIDE OF HORIZONTAL ENGINE Can Be Pitted for Any Kind of Artificial, Natural, or Producer Gas



P16. 3736A

FOOS GASOLINE ENGINES

ELECTRIC IGNITER

Safe, Convenient, Economical, Simple

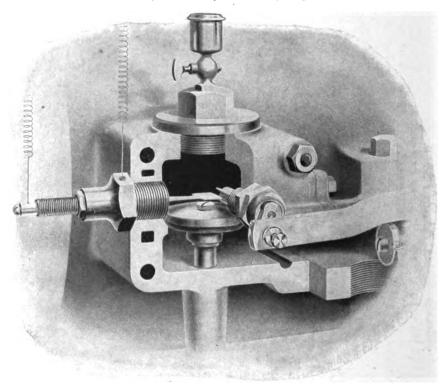


Fig. 9546A

GOVERNOR — Geared Governor of the centrifugal fly-ball type, superior in design and construction, very sensitive, and capable of speed adjustment while engine is running.

Vertical Valves—Inlet and Exhaust Valves of the vertical poppet type and both absolutely positive in their action. The inlet valve is lifted by its cam at the proper time, not depending upon suction of piston, and regardless of the speed of the engine the valve is held open until the mixture within the cylinder reaches atmospheric pressure. The charges admitted are uniform and of maximum volume, insuring the highest efficiency as to power, economy, and smooth running.

PATENT IGNITER — Electric Igniter of our patent wipe spark type. The revolving electrode blade wipes the edge of the stationary electrode spring, preventing all corrosion, scale, or dirt from accumulating on the contact points, which would prevent the ignition of charge and result in loss of power, waste of fuel, and irregularity of speed.

WHEN ORDERING BY FIGURE NUMBER, PLEASE GIVE THE PAGE NUMBER ALSO.

FOOS GASOLINE ENGINES

GEARED GOVERNOR
FURNISHED ON ALL FOOS HURIZONTAL ENGINES

INLET AND OUTLET OR EXHAUST VALVES

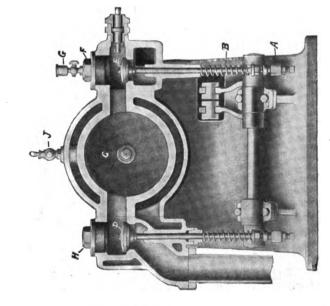
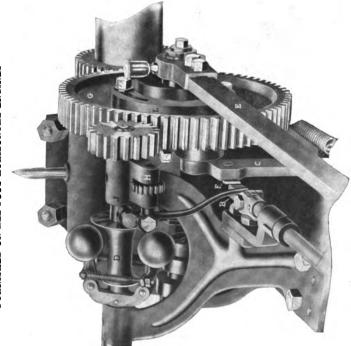


Fig. 9545B



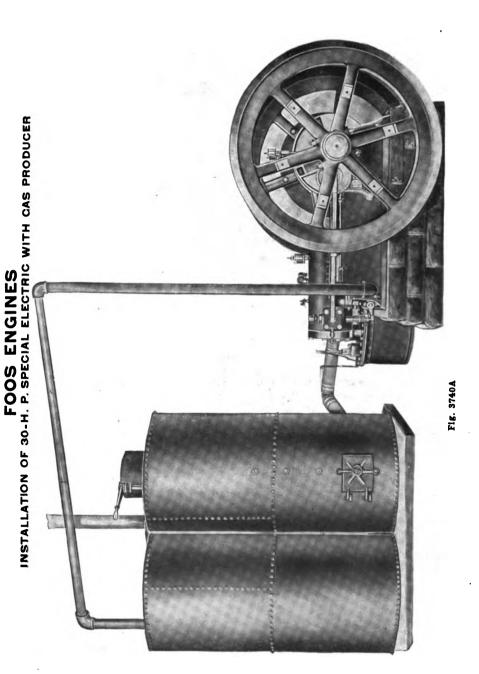
For description see preceding page.

FOOS SPECIAL ELECTRIC ENGINE

DO NOT CUT CATALOGUE, ORDER BY FIGURE NUMBER.

Fig. 3742A

be, when for use upon gas, equipped with a throttling governor and has extra fly-wheels, which have wide crowned faces to carry dynamo belt, no pulley being furnished. This engine being especially designed for this service and being properly We are furnishing a large number of these Special Electric Engines for store, heavy factory and residence lighting. It may constructed and each engine exhaustively tested, no more practicable power can be found for independent and isolated ighting plants.



Digitized by Google

THE FOOS JUNIOR



Fig. 3743A

This engine is of a wholly different type from the regular Foos and its simplicity is clearly shown by the illustration. Every detail has been carefully worked out, and the engine particularly designed for small plants or ranch and farm work under conditions where the attention received is often limited.

Each is guaranteed to develop its rated horse-power, which is another feature in which it differs from many of these small engines.

The Junior is furnished in the 2, 4.6 and 8 H. P. sizes with or without pump jacks, tank, etc., and for either gas or gasoline.

Regular Equipment with each Junior Engine, unless otherwise specified, includes oil cups, jump spark coil, igniter plug, dry cells, switch, insulated wire, gasoline tank for gravity feed (or gas dial cock and reservoir when for gas), pulley, muffler or exhaust pot, oil can, wrench and sample gallon of cylinder oil.

Equipment No. 1 consists of a Junior Engine with regular equipment above, with the 2 and 4 H. P. Engines an iron sub-base in which the coil and batteries may be placed is included.

Equipment No. 2. Includes the Junior Engine with regular equipment and a water tank to which the gasoline tank is attached, mounted with the engine on an iron subbase, all wired and connected up ready to run.

Equipment No. 3. Includes the Junior Engine with evaporator jacket, and the regular equipment. The 2 and 4 H. P. have an iron sub-base, in which the battery and spark coil are placed, and these sizes are sent out wired up ready to run.

Equipment No. 4. Includes the evaporator jacket Junior Engine with regular equipment, and mounted on wood skids beyeled at one end. The battery is placed in a box on the skids in front of the engine.



THE FOOS JUNIOR

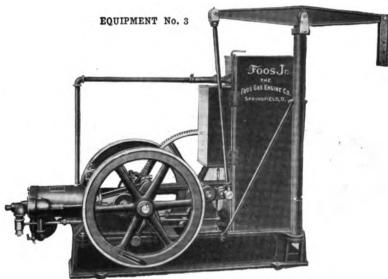


Fig. 6391A

Equipment No. 5. Includes the Junior Engine with regular equipment, also water tank with gasoline tank attached, with pump jack for ordinary wind mill pumps with iron standard walking beam, all mounted on iron sub-base. Speed of gear is 49 R. P. M. with engine running at 400 R. P. M.; strokes 5¾ inches and 7¾ inches. Is fitted with an eccentric to throw the pump jack out of gear.

Equipment No. 6. Includes Evaporator Jacket Junior Engine with regular equipment, and with pump gear and walking beam, carried on an extension of the engine cylinder all mounted on an iron sub-base wired up ready to run. The normal speed of gear is 49 R. P. M., with strokes 534 inches and 734 inches, and has an eccentric to throw

pump jack out of gear.

Equipment No. 7. Evaporator Jacket Junior Engine with regular equipment,

mounted on a small four-wheeled hand truck with wood beams and iron wheels.

Equipment No. 8. The Evaporator Jacket Engine with regular equipment, mounted on an all steel truck similar to those used in the regular portable line. The gasoline tank, batteries and coil are placed under the driver's seat. Single and double trees and neck yoke are included—but no brake. For 20 x 4 friction clutch pulley in place of solid pulley add 40.00.

Equipment No. 9. Evaporator Jacket Engine with regular equipment, mounted on

a wood truck with steel wheels, which carries a tilting table sawing attachment.

Equipment No. 10. Evaporator Jacket Junior Engine with regular equipment, and a heavy pump jack for deep well pumps, with an eccentric by which it can be thrown out of gear—all carried on a wood sub-base. The standard and walking beam are also of wood. Normal speed of gear is 37 R. P. M., with strokes of 12 inches, 16 inches and 20 inches. Water tank can be furnished instead of evaporator jacket if preferred at the same price. Equipment No. 11. Junior Engine with regular equipment, direct geared to a hori-

zontal Bulldozer pump, all mounted on an iron sub-base, containing the batteries and spark coil wired ready to run. The pump can be thrown out of gear by an eccentric. The outfit is regularly fitted with a pump cylinder $5 \times 5\frac{1}{2}$ inches with 2 inch connections, giving about 40 gallons per minute; but can also be furnished at 14 00 extra with a 4 x 5 inch cylinder giving 24 gallons—connections 1½ inches. Designed for suction lift up to 25 feet and to force water 75 feet high, which is equivalent to a pressure of about 33 pounds per square inch.

No pipe, fittings, cooling water tanks, or extras, beyond those specified are furnished

except at additional cost.

FOOS GASOLINE ENGINES EQUIPMENT NO.11 Z. H. P. JUNIOR WITH BULLDOZER PUMP ALTERNA

PIE. 9547A

The above shows our Equipment No. 11, which is furnished in the 2 H. P. size only. The capacity is forty gallons per minute, with a suction lift up to about 25 feet and a lift above the pump of about 75 feet, or against an approximate pressure of 33 pounds per square inch. The pump gear can be thrown out by an eccentric bearing to permit use of the engine for other purposes, which makes this a very satisfactory equipment for small pumping plants, country homes, etc. Prices on application.

FOUR-VALVE ENGINE

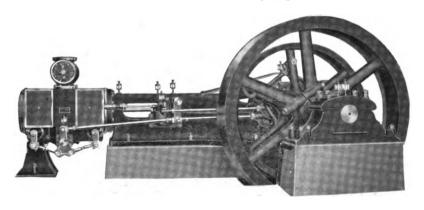


Fig. 2064A

HIGH SPEED AUTOMATIC ENGINE

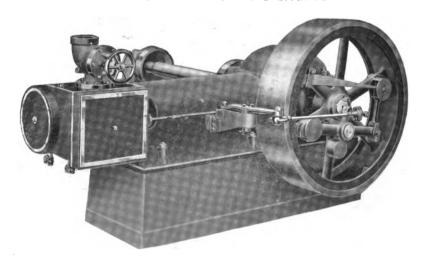


Fig. 2064B

ECONOMIC ENGINE

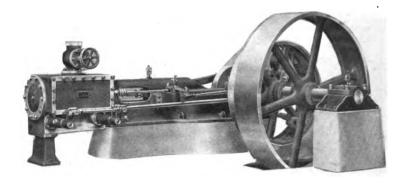


Fig. 2065A

TANGYE BED AUTOMATIC ENGINE

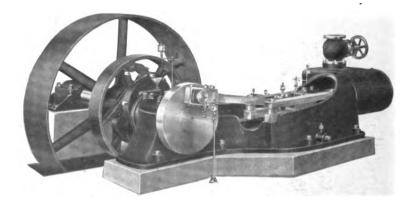


Fig. 2065B



MEDIUM SPEED AUTOMATIC ENGINE CLASS C-C

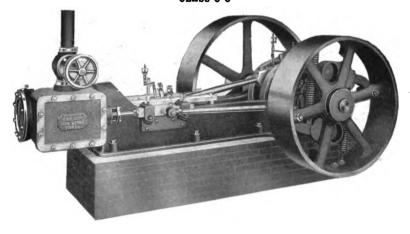


Fig. 2066A

TANGYE BED THROTTLING ENGINE

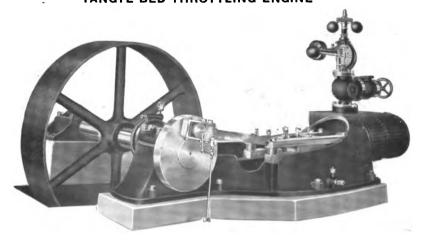


Fig. 2066B



CENTER CRANK THROTTLING ENGINE CLASS D

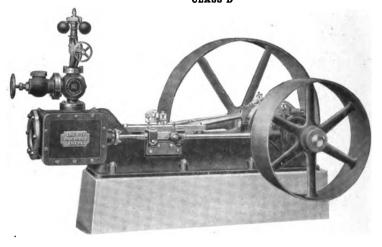


Fig. 2067A

SELF-CONTAINED SIDE-CRANK ENGINE CLASS 8-C

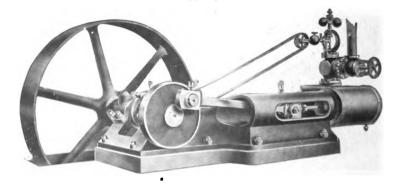


Fig. 2067B



BORED-GUIDE SIDE-CRANK ENGINE CLASS H

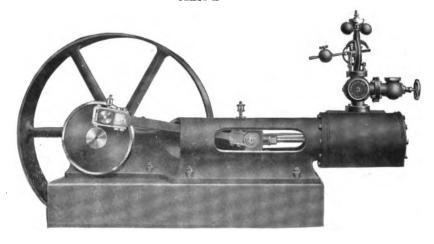


Fig. 2068A

PORTABLE ENGINE ON SKIDS

CLASS A

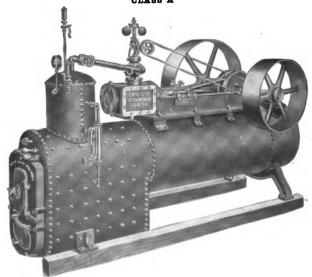


Fig. 2068B

ERIE CITY ENGINES AND BOILERS

PORTABLE ENGINE ON WHEELS

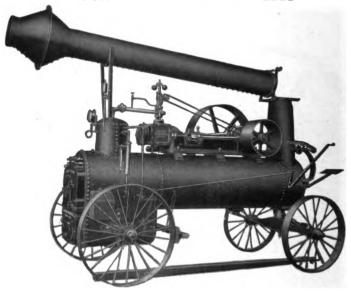


Fig. 2069A

ECONOMIC RETURN TUBULAR PORTABLE BOILER

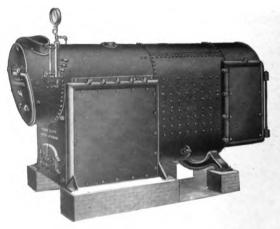


Fig. 2069B

HORIZONTAL RETURN TUBULAR STATIONARY

HALF FRONT

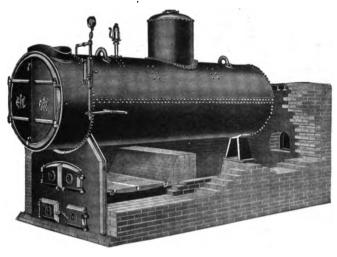


Fig. 2070A

FULL FRONT

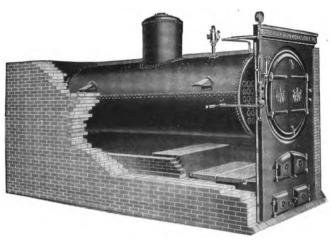


Fig. 2070B

HORIZONTAL TUBULAR STATIONARY BOILERS WITH STEEL CASING

HALF ARCH FRONT

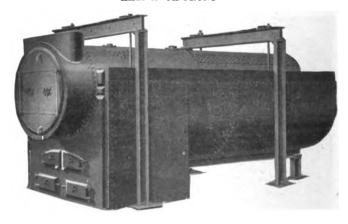


Fig. 2071A

DOUBLE SETTING SHOWING DUTCH OVEN

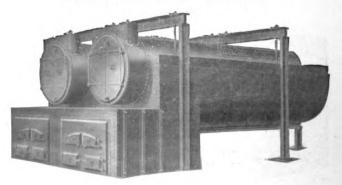


Fig. 2071B

WATER BOTTOM PORTABLE
CLASS A

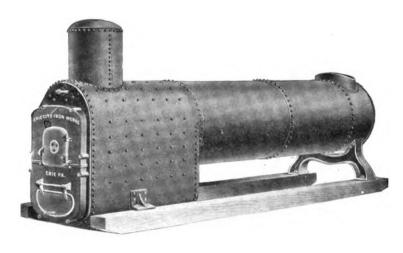


Fig. 2072A

OPEN BOTTOM PORTABLE

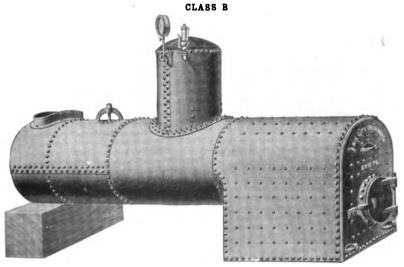


Fig. 2072B

STATIONARY BOILER-HIGH PRESSURE



Fig. 2074A

HORIZONTAL WATER TUBE BOILER

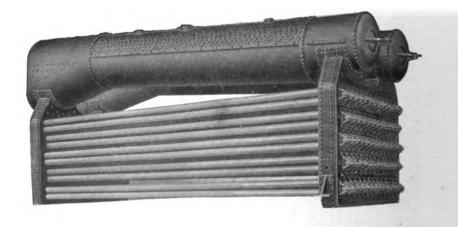
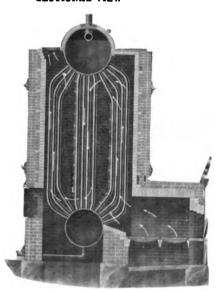


Fig. 2074B

VERTICAL WATER TUBE SECTIONAL VIEW



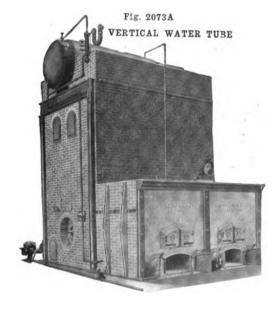


Fig. 2073C

VERTICAL TUBULAR FULL LENGTH TUBE



Fig. 2073B
VERTICAL TUBULAR
SUBMERGED TUBE



Fig. 2073D

AMERICAN BOILERS AND RADIATORS

SECTIONAL BOILER



Fig. 8582A

ARCO ROUND BOILER WATER



Fig. 8582B

IDEAL SECTIONAL BOILERS

Can be furnished in the following capacities:
Steam — 300 to 8550 Square Feet. Water — 500 to 14125 Square Feet.

IDEAL ARCO ROUND BOILERS

Can be furnished in the following capacities: Steam—Hard Coal, 350 to 1650 Square Feet. Water—Hard Coal, 575 to 2725 Square Feet. Soft Coal, 275 to 1250 Square Feet. Soft Coal, 450 to 2075 Square Feet.

IDEAL PREMIER ROUND BOILERS

Can be furnished in the following capacities: Steam - 175 to 900 Square Feet. Water - 300 to 1475 Square Feet.

CAST IRON RADIATORS

ROCOCO - THREE COLUMN ORNAMENTAL

PEERLESS-THREE COLUMN, PLAIN



Fig. 8582C



Fig. 85821

Send for special catalogue giving complete ratings, measurements, prices, etc

INGERSOLL-RAND COMPRESSORS

AIR

A-1



IMPERIAL

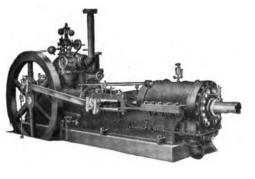


Fig. 6732A



Fig. 6732B

A-1 Air Compressors represent the most modern development of all compressor types, Simple in construction, operated with great economy. Just as efficient as tandem compounds with complicated mechanical air valve movements.

Imperial X-1 Compressors are power driven compressors, representing duplex construction applied to small sizes. Have twin vertical, single-acting, balanced cylinders either duplex or compound, with a driving wheel between. Very simple and require very little floor space. Solid, rugged, powerful construction.

IMPERIAL

x

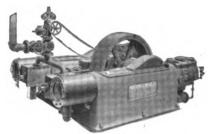


Fig. 6732C

Imperial X Compressors are very compact, duplex, steam driven machines, with a larger capacity for the floor space required than any other duplex type.

Very simple, self-contained, solid machines, completely accessible and as easily installed, operated and maintained as straight line compressor.

Automatic flood lubrication system provided for all principal bearings.

Prices on application

GRATE BARS COMMON, LIGHT PATTERN



Fig. 5822A

| Lengthinches | 24 | 26 | 27 | 28 | 30 | 33 | 34 | 35 | 36 | 38 | 42 | 48 | 54 | 60 |
|-----------------------------|--|--|-------------------|------------------|---------------------|-------------------|--|----------|---------|--------------------|---------|---------|---------|---------|
| Widthinches Weightpounds | $\begin{array}{ c c }\hline 2\frac{3}{4}\\ 16\\ \end{array}$ | $\begin{array}{ c c } \hline 23/4 \\ 17 \\ \hline \end{array}$ | $\frac{23/4}{17}$ | $\frac{234}{23}$ | $\frac{2^{3}4}{24}$ | $\frac{23/4}{34}$ | $\begin{array}{ c c c }\hline 2\frac{3}{4}\\ 34\\ \end{array}$ | 2¾ 35 | 3 36 | 28/ <u>4</u> 38 | 3 40 | 3 48 | 3 52 | 3 68 |

Above grate bars have 1/2-inch air space.

COMMON, HEAVY PATTERN



Fig. 5822B

| Lengthinches | 42 | 48 | 50 | 54 | 60 | 66 | 72 |
|--------------------------|----------------|----------|----------|----------|----------|------|------|
| Width inches Air Space " | $5\frac{7}{8}$ | 3 5/8 | 3 5/8 | 3 5/8 | 3 5/8 | 31/2 | 31/2 |
| Weightpounds | 50 | 01 | 02 | 68 | 83 | 104 | 113 |

IMPROVED



Fig. 5822C

| Lengthinches | 33 | 36 | 42 | 48 | 54 | 60 | 66 | 72 |
|-----------------------|-----|----------------|----------------|---------------|---------------|-----------------|----------------|---------------|
| Widthinches Air Space | 1/2 | 6 1/2 73 | 6 1/2 86 | 6 ½ 100 | 6 ½ 115 | 6 1/2 130 | 6 14 142 | 6 % 160 |

SHAVING



Fig. 5822D

| Lengthinches | 30 | 36 | 42 | 48 | 54 | 60 |
|---------------|----|----|----|----|----|----|
| Widthinches | 6 | 6 | 6 | 6 | 6 | 6 |
| Weight pounds | 32 | 45 | 59 | 72 | 83 | 94 |

OBTUSE



| - | 04 | - | 5 | 0 | 0 | . 7 | , |
|---|----|---|---|---|---|-----|---|
| | | | | | | | |

| Lengthinches | 30 | 36 | 36 | 42 | 48 | 54 | 60 | 66 |
|--------------|----|----|----|----|----|-----|-----|-----|
| Widthinches | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 |
| Weightpounds | 50 | 60 | 60 | 75 | 90 | 105 | 120 | 135 |

Above Grate Bars have 3 g-inch Air Space and 3 g-inch Metal.

GORDON HOLLOW BLAST GRATES AND SMOKE STACKS

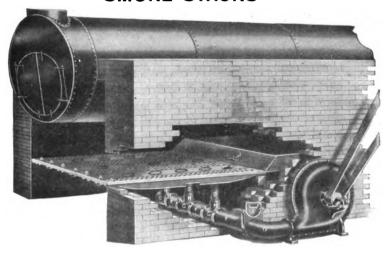


Fig. 4913A

Adds from 25 to 50 per cent to the efficiency of a boiler.

Runs your mill with your refuse, giving as good results with wet, green or frozen sawdust alone as a draft grate gives with dry wood. It thus affords the best and most economical means in existence for disposing of refuse, doing away with all hauling and utilizing the heat derived from the refuse to run the mill, thus converting it from a source of expense into a source of profit.

Sold on approval, subject to thirty days exhaustive test. In case of rejection, the

manufacturers pay the freight both ways.

In writing for prices please answer the following questions:

How many boilers have you?

Have you plain furnaces or Dutch ovens?

What are the width and length of your grate surface or surfaces?

SMOKE STACKS

| Diameterinches | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 |
|--|--|--|------------------------------|------------------------------|------------------------------|------------------------------|---------------------|-----------------------|------------------|---------------|
| Price, No. 16, Ironper foot | 1.04 | 1.12 | 1.20 | 1.28 | 1.36 | 1.44 | $\overline{1.52}$ | 1.60 | 1.92 | 2.08 |
| " " 14 " " | | | | | | | | 2.32 | | |
| " " 12 " " | | 1.84 | 2.08 | 2.24 | 2.32 | 2.48 | 2.64 | 2.80 | 2.96 | 3.12 |
| " " 10 " " | | | 2.64 | 2.88 | 3.04 | 3.20 | 3.44 | 3.68 | 3.82 | 4.16 |
| " Dampereach | 4.00 | 4.40 | 4.80 | 4.80 | 4.80 | 6.40 | 6.40 | 6.40 | 6.40 | 6.40 |
| " Umbrella Top " | 4.00 | 4.00 | 4.80 | 4.80 | 4.80 | 6.40 | 6.40 | 6.40 | 6.40 | 6.40 |
| | | | | | | | | | | |
| Diameterinches | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 | 48 |
| Diameterinches Price, No. 16, Ironper foot | | 30 2.40 | | | | · . | | 42 | | 48 |
| Price, No. 16, Iron per foot | 2.24 | 2.40 | | | | | | | · | |
| Price, No. 16, Ironper foot | $\frac{2.24}{2.96}$ | $\frac{2.40}{3.20}$ | 3.44 | 3.60 | 3.84 | 4.00 | | | ` ' • • • • • | |
| Price, No. 16, Iron per foot | 2.24 2.96 3.20 4.48 | $\begin{vmatrix} 2.40 \\ 3.20 \\ 3.60 \\ 4.80 \end{vmatrix}$ | 3.44 3.84 5.12 | 3.60 4.00 5.44 | 3.84 4.24 5.76 | 4.00 4.40 6.08 | 4.64 6.48 | 4.80 6.80 | 7.20 | 7.60 |
| Price, No. 16, Iron per foot " " 14 " " " " 12 " " | $egin{array}{c} 2.24 \\ 2.96 \\ 3.20 \\ 4.48 \\ 6.40 \\ \end{array}$ | 2.40 3.20 3.60 4.80 9.60 | 3.44 3.84 5.12 9.60 | 3.60 4.00 5.44 9.60 | 3.84 4.24 5.76 9.60 | 4.00 4.40 6.08 9.60 | 4.64 6.48 11.20 | 4.80 6.80 11.20 | 7.20 12.80 | 7.60 12.80 |

For elbow in stack, add cost for 8 feet of stack.

FIRE BRICKS STANDARD 9-INCH AND 9-INCH SHAPES

9 INCH STRAIGHT



Fig. 4690A



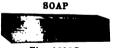


Fig. 4690C

BESSEMER SOAP



Fig. 4690D

No. 1 ARCH 45 Brick to Circle 27 inches inside diameter



Fig. 4690E

No. 2 ARCH 25 Brick to Circle 12 inches inside diameter



Fig. 4690F

No. 1 BULLHEAD 128 Brick to Circle 7 feet inside diameter



Fig. 4690G

No. 3 BULLHEAD 95 Brick to Circle 3 feet inside diameter



No. 1 KEY 113 Brick to Circle 12 feet inside diameter



Fig. 4690K

No. 2 BULLHEAD 63 Brick to Circle 30 inches inside diameter



Flg. 4690H

No. 3 KEY 41 Brick to Circle 3 feet inside diameter



Fig. 4690M

No. 4 KEY 30 Brick to Circle 2 feet inside diameter



Fig. 4690N

No. 2 KEY 63 Brick to Circle 6 feet inside diameter



Flg. 4690L

END SKEW No. 1



END SKEW No. 2



Fig. 4690Q





Fig. 4690R

Prices on application.

EMERSON STEAM PUMPS

FRONT VIEW



Fig. 5143A

REAR VIEW



Fig. 5143B

| | | NDER HE8 | Capacity | | Connec Inches | | DIMEN | sions Ove Inches | er All | Approx- imate | Price |
|-----|-------|-------------|-----------------------|---------------------|------------------|----------------|--------|---------------------|--------|------------------|---------|
| No. | Diam. | Length | per Minute Gallons | | Suction | Dis- charge | Height | Breadth | Width | Weight Pounds | Each |
| 1 | 6 | 72 | 225 | 34 | 3 | 21/2 | 971/2 | 1616 | 18 | 950 | 275.00 |
| 2 | 8 | 78 | 415 | 1 | 4 | 3 ~ | 104 | 2113 | 21 | 1375 | 350.00 |
| 3 | 10 | 84 | 725 | 114 | 5 | 4 | 113 | 26 | 24 | 1900 | 500.00 |
| 4 | 12 | 96 | 1200 | 11/2 | 6 | 5 | 127 | 291/2 | 2716 | 3100 | 700.00 |
| 5 | 16 | 96 | 2100 | 2 2 | 8 | 6 | 132 | 431/4 | 33 | 4400 | 1150.00 |
| 6 | 20 | 96 | 3275 | $\bar{2}$ ι_2 | 10 | 8 | 135 | 5114 | 3634 | 5400 | 1700.CO |

Capacities vary with steam pressure and height of lift.

Prices of Special Sizes and those entirely of Bronze furnished on application.

These Pumps are especially adapted for mining, irrigation, contractors, etc., etc.

As a Sinking Pump they are without an equal.

THE NEW PULSOMETER STEAM PUMPS





Fig. 4915A



Fig 4015

| | | Pipe nnect Inche | IONS | MINUTE | Approximate Capacity Gallons per Minute at Different Elevations with Boiler Power Uscally Provided | | | | Dimensions / E O O | | ndard) | r Ball |
|--------|--------------------------|------------------------|------------------|---------|---|---------|----------------------------|--------|------------------------|-----------|------------------------------------|------------------------------------|
| Number | Steam | Suction | Discharge | 25 Feet | 50 Feet | 75 Feet | Horse Power Required | Helght | Floor | Weight Po | Price, with Valve (Star Each | Price, with Valve (Spec Each |
| 2 | 14 | 11/2 | 11/2 | 20 | 17 | 13 | 4 | 25 | 14x13 | 95 | 75.00 | |
| 3 | 3/8 | '2 | • 2 | 60 | 50 | 38 | 5 | 27 | 17x14 | 140 | 100.00 | 106.00 |
| 4 5 | 1/2 | $2\frac{1}{2}$ | $2\frac{1}{2}$ | 100 | 80 | 65 | 6 | 33 | 19x19 | 295 | 150.00 | 158.00 |
| | $\frac{1}{1}\frac{2}{2}$ | 3 | ₊ 3 - | 180 | 160 | 115 | 9 | 38 | 21x22 | 430 | 175.00 | 187.0 |
| 6 | 3.4 | 31/2 | $+3\frac{1}{2}$ | 300 | 265 | 200 | 12 | 43 | 23x24 | 570 | 225.00 | 241.00 |
| 7 | 34 | 4 | +4 | 425 | 375 | 275 | 15 | 49 | 25x26 | 745 | 275.00 | 300.00 |
| 8 | 1 | 5 | 5 | 700 | 625 | 450 | 25 | 61 | 32x33 | 1375 | 400.00 | 440.00 |
| 9 | 11/2 | 7 | 6 | 1000 | 900 | -650 | 35 | 72 | 39 x 36 | 2100 | 500.00 | 550.00 |
| 10 | 2 | 8 | 8 | 2000 | 1800 | 1400 | 70 | - 88 | -52×45 | 3800 | 1000.00 | |

The prices above include suitable strainer, either basket or mushroom, steam-controlling globe valve with nipple and union, and relief valve. The capacities given are estimated from results obtained in actual practice and are rather underrated, better results being obtained in most cases, especially so where conditions are favorable as to short suction, high steam pressure, etc. Flat valve pumps are used for all general purposes.

The Pulsometer Pump is a handy, simple, durable and efficient pumping apparatus

The Pulsometer Pump is a handy, simple, durable and efficient pumping apparatus for unwatering excavations, cofferdams, quarry pits, sewer trenches, shallow mines, etc. Requires no engine, belt, oil, packing or special foundation. Operates as well suspended as stationary, and may be raised or lowered as occasion demands, without interrupting its work. Having no exhaust steam to be disposed of (steam condenses and passes off with water discharged), it is particularly well adapted for underground service.

FUEL OIL APPARATUS

No. 2 PUMPING OUTFIT

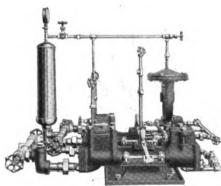


Fig. 3608A

This outfit consists of two duplex pumps cross connected so that either or both pumps can be used, and a simple bed-plate to rest on a brick pier or stand.

Fitted with automatic pressure regulator, suction strainer, air chamber with gas valve for relieving air chamber of excessive ac cumulation of gas.

Pumps of any size can be furnished arranged in this way.

Prices on application.

No. 3 BRASS BURNER-Steam Connections

This is a small burner designed for use in brick kilns and similar work. Regulation of the flame can be made, varying from blaze, small enough to drive off water smoke to the greatest volume required in progress of the burning. Also suitable for small boilers.



Prices on application.

PEABODY BURNER

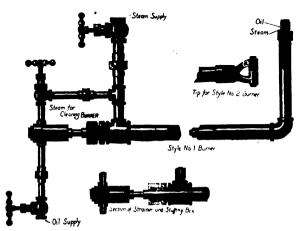


Fig. 3608C

Prices and descriptive matter on application.

KNOWLES SPECIAL DUPLEX PUMPS

PRESSURE PATTERN FOR BOILER FEEDING, ETC.

SIZE 6 x 4 x 6

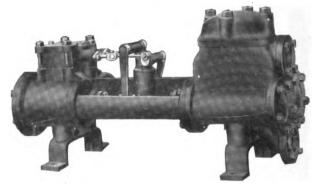


Fig. 8589A

SIZE 14 x 1014 x 10

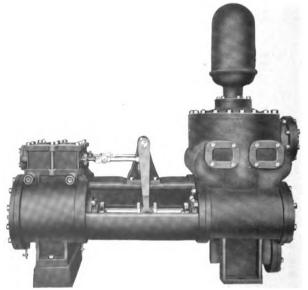


Fig. 8589B

KNOWLES SPECIAL DUPLEX PUMPS

PRESSURE PATTERN FOR BOILER FEEDING, ETC.

| CYLI | NDERS HES | Length of Stroke | Capacity per Stroke Each | Strokes per Minute | Capacity of Both Cylinders | Рин | e Connec | rions, In | CHES |
|---|------------------------------|---------------------|--------------------------------|-----------------------|----------------------------------|--------------------------------------|---|----------------|------------------|
| Steam | Water | Inches | Piston Gallons | Each Piston | per Minute Gallons | Steam | Exhaust | Suction | Disch'g |
| 2 | 11/4 | 234 | .014 | 100 to 300 | 2 to 8 | 3 8 | 1 2 | 1 | 3/4 |
| 3 | 2 | 3 | .04 | 100 " 250 | | 3 8 | $1\frac{7}{2}$ | 11/4 | 1 |
| $41/_{2}$ | 234 | 4 | . 10 | 100 " 200 | | | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 2 | 2 |
| $5\frac{1}{4}$ | 3,2 | 5 | .20 | 100 " 200 | | 34 | 1),7 | $2\frac{1}{2}$ | $2^{1}2$ |
| 6 | 4 | 6 | .33 | 100 " 150 | | 1 | $\begin{array}{c c} 11\frac{7}{2} \\ 11\frac{7}{2} \end{array}$ | 3 | 3 |
| $71\frac{2}{2}$ $71\frac{2}{2}$ $71\frac{2}{2}$ | 5 | 6 | .51 | | 100 " 150 | 11/4 | 11/2 | 4 | 3 |
| $7^{1}\frac{7}{2}$ | 41/2 51/4 51/4 51/4 | 10 | . 69 | 75 " 125 | | 194 | 1_{12} | 4 | 3 |
| | 5/4 | 10 | .93 | 75 " 125 | | 11/4 | | 4 | 3 |
| 8 | 5)4 | 10 | . 93 | 75 " 125 | | $1^{\frac{1}{2}}_{2}$ | 2 | 4 | 3 |
| 9 | 514 | 10 | . 93 | | 135 " 230 | 1^{1} | 2 | 4 | 3 |
| 8 | 6 | 10 | 1.22 | | 180 " 300 | $1^{1} ar{2}$ | 2 | 5 | 4 |
| 10 | 6 | 10 | 1.22 | 75 " 125 | | $1^{1}rac{7}{2}$ | 2 | 5 | , 4 |
| 10 | 6 | 12 | 1.47 | | 191 " 308 | 1^{1} $\frac{7}{2}$ | 2 | . 5 | 4 |
| 10 | 7 | 10 | 1.66 | 75 " 125 | | $1^{_{1}} \mathbf{	ilde{_{2}}}$ | 2 | 6 | 5 |
| 10 | 7 | 12 | 2.00 | | 260 " 420 | $\frac{1}{2}$ $\frac{1}{2}$ | 2 | 6 | 5 5 5 5 |
| 12 | 7 | 10 | 1.66 | | 245 " 410 | $2\iota_{2}$ | 3 | 6 | 5 |
| 12 | 7 | 12 | 2.00 | | 260 " 420 | 21 3 | 3 | 6 | 5 |
| 14 | 7 | 10 | 1.66 | 75 " 125 | | $2^{1}\frac{7}{2}$ | 3 | 6 | 5 |
| 14 | 7 | 12 | 2.00 | | 260 " 420 | $2^{1}rac{7}{2}$ | 3 | 6 | 5 5 5 |
| 10 | 81 2 | 10 | 2.45 | | 365 " 610 | $11\frac{7}{2}$ | 2 | 6 | 5 |
| 10 | 81 2 | 12 | 2.95 | 65 " 105 | | $1^{\hat{1}}\hat{2}$ | 2 | 6 | 5 5 |
| 12 | 81 2 | 10 | 2.45 | | 365 " 610 | 2 1 $\frac{7}{2}$ | 3 | 6 | |
| 12 | 81.2 | 12 | 2.95 | | 383 " 619 | 2^{1} | 3 | 6 | 5 |
| 14 | 81 2 | 10 | 2.45 | | 365 " 610 | 2 1 $\frac{7}{2}$ | 3 | 6 | 5 |
| 14 | 81 2 | 12 | 2.95 | | 383 " 619 | $20\frac{7}{2}$ | 3 | 6 | 5 |
| 16 | $8^{1}\frac{2}{2}$ | 10 | 2.45 | | 365 " 610 | 2 ı $\frac{7}{2}$ | 3 | 6 | 5 |
| 16 | 81 2 | 12 | 2.95 | | 383 " 619 | $2^{1}\frac{7}{2}$ | 1 3 | 6 | 5 |
| 18^{1}_{-2} | 81 2 | 10 | 2.45 | | 365 " 610 | 3 | 31.2 | 6 | 5 |
| 18^{1}_{2} | 81 2 | 12 | 2.95 | | 383 " 619 | 3 | 312 | 6 | 555555557 |
| 20 | 812 | 10 | 2.45 | | 365 " 610 | 4 | 5 | 6 | 5 |
| 20 | $81\frac{7}{2}$ | 12 | 2.95 | | 383 " 619 | 4 | 5 | 6 | 5 |
| 12 | 1014 | 10 | 3.57 | | 530 " 890 | 2^{1} . | 3 | 8 | 7 |
| 12 | 1014 | 12 | 4.30 | | 555 " 900 | 21 5 21 5 21 5 21 5 21 5 | 3 | ' 8 | 7 |
| 14 | 1014 | 10 | 3.57 | | 530 " 890 | $2\iota_2$ | 3 | 8 | 7 |
| 14 | 1014 | 12 | 4.30 | | 555 " 900 | 21 2 | 3 | 8 | 7 7 7 7 |
| 16 . | 101 2 | 10 | 3.75 | | 5 60 " 935 | $2^{1\frac{7}{2}}$ | 3 | 8 | 7 |
| 16 | 101 2 | 12 | 4.50 | | 585 " 945 | $2^{1\frac{7}{2}}$ | 3 | 8 | 7 |
| 181.2 | 101 2 | 10 | 3.75 | 75 " 125 | | 3 - | 31 2 | 8 | |
| $18^{1}\frac{7}{2}$ | 10^{1}_{2} | 12 | 4.50 | 65 " 105 | | 3 | 3 | 8 | 7 |
| 20 | 101 2 | 10 | 3.75 | | 560 " 935 | 4 | 5 | 8 | . 7 |
| 20 | 1013 | 12 | 4.50 | 65 " 105 | 585 " 945 | 4 | 5 | . 8 | 7 |

These pumps are provided with double acting water pistons, and are suitable for boiler feeding, fire service, or for general purposes. The water cylinders are brass lined, and the water pistons are arranged so that the packing may be readily renewed when required.



DUPLEX PUMPS

PISTON PATTERN WITH DRIVEN LINERS

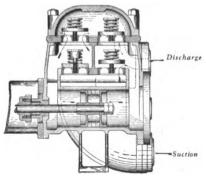


Fig. 5968A

PISTON PATTERN WITH REMOVABLE LINERS

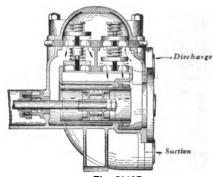


Fig. 5968B
PLUNGER AND RING PATTERN
ARRANGED TO USE PACKED PISTONS

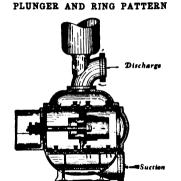


Fig. 5968C

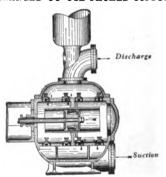


Fig. 5968D OUTSIDE CENTER PACKED PLUNGER PATTERN

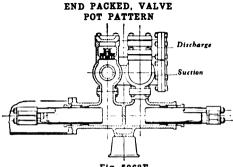


Fig. 5968E

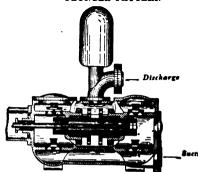


Fig. 5968F

The above illustrations show sectional views through those types of Pumps for which there is the greatest demand.

DUPLEX FIRE PUMPS



Fig. 7587A

| CYLINDE | s, Inches | Length of Stroke | Gallons L | | | | | | | |
|----------------|-----------|---------------------|-----------|-----------------|----------------|---------|---------|-----------|--|--|
| Steam | Water | Inches | | By Both Pistons | | Exhaust | Suction | Discharge | | |
| 10 | 5 | 12 | 204 to | 306 | 2 | 213 | 5 | 4 | | |
| 10 | 6 | 12 | 294 " | 441 | 2 | 21.5 | 6 | 5 | | |
| 12 | 6 | 12 | 294 " | 441 | 21/3 | 3 | 6 | 5 | | |
| 12 | 7 | 12 | 400 " | 600 | 213 | 3 | 8 | 6 | | |
| 14 | 7 | 12 | 400 " | 600 | $21\sqrt{3}$. | 3 | 8 | 6 | | |
| 14 | 8 | 12 | 522 " | 783 | 213 | 3 | . š | Ğ | | |
| 16 | 8 | 12 | 522 " | 783 | 21.3 | 3 | 8 | . ĕ | | |
| 16 | 81, | 12 | 598 " | 382 | 21% | 3 | 8 | Ğ | | |
| 16 | 9 ~ | 12 | 660 " | 990 | 21.5 | 3 | 10 | 7 | | |
| 18 | 9 | 12 | · 660 " | 990 | 3 | 314 | 10 | 7 | | |
| 18 | 10 | 12 | 816 " | 1224 | . 3 | 3 5 | 10 | Ř | | |
| 18 | 10 | 18 | 816 " | 1224 | 3 | 31.3 | 10 | š | | |
| 20 | 10 | 18 | 816 " | 1224 | 4 | 5 2 | iŏ | ä | | |
| $\frac{1}{20}$ | 12 | 18 | 1174 " | 1761 | 4 | 5 | 12 | · 10 | | |

These pumps are designed and constructed as Quick Working Fire Pumps. The valve areas and water passages are unusually large, to insure the complete and easy filling of the pump chambers when pump is running at its greatest speed.

Pumps are fitted with two, four or six-way hose connections when required, at an

extra cost.

DUPLEX UNDERWRITER'S FIRE PUMPS



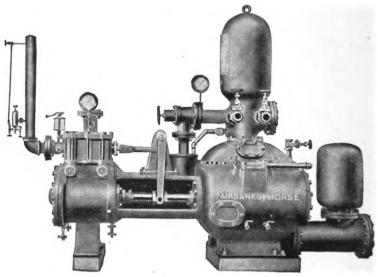


Fig. 7178A

| Diameter of Steam Cylinders Inches | Diameter of Water Cylinders Inches | Length of Stroke Inches | Capacity Gallons per Minute | PIPE SI | ZES FOR SHO | RT LENGTH | s. Inches | Floor Space Inches |
|---|---|---|-----------------------------|--|-------------|---|-----------|--------------------------|
| 14 | 7 | 12 | 500 | 3 | 4 | 8 | 6 | 103x43 |
| 16 18 | 9 10 | $\begin{array}{c} 12 \\ 12 \end{array}$ | 750 1000 | $\begin{vmatrix} 3 \\ 4 \end{vmatrix}$ | 5 | $\begin{array}{c} 10 \\ 12 \end{array}$ | 8 | 103x44 110x50 |
| 20 | 12 | 16 | 1500 | 5 | 6 | 14 | 10 | 134x66 |

The Underwriter Fire Pump is the title adopted by the Factory Mutual Fire Insurance Companies of Boston, Mass., to designate a duplex steam fire pump that is built in strict accordance with the specifications issued by those companies. These pumps are built of unusual strength, with very large valve areas, and the design contains several important features not found in other pumps of the usual construction.

These pumps are brass fitted throughout to prevent any possibility of the working parts rusting together in case the pump stands idle for a time.

With every pump there are furnished certain fittings called for by the specifications which are not required with our other fire pumps. Among these fittings are the following:

A suction elbow or tee, suction air chamber, brass priming pipes with air cocks and check valves, stroke gauge, capacity plate, steam gauge, water gauge, air relief valve water relief valve with funnel, hose gate valves, lever handle drain valves for both the steam and water ends, sight feed lubricator and a hand oil pump for the steam cylinders.

Every pump is given a most rigid test before shipment, including a test of the water end to 300 pounds static pressure.

DUPLEX PUMPS PLUNGER AND RING PATTERN LOW SERVICE OR TANK For Water Pressures not Exceeding 75 Pounds SIZE 8 x 10 x 12



Fig. 5371A

| Size of Pump. Inches | | | | Strokes | | | Sho | Pipe Sizes for Short Lengths, Inches | | | | |
|--|--|------------------------|-------|-------------|-----|---|--------------------|---|---------|----------------|---------------------------|--|
| Diam. of Steam Cylin- ders | Diam. of Water Cylin- ders | Length of Stroke | per | per | | Gallons Delivered per Minute by Both Pistons | Steam | Ex- haust | Suction | Dis- charge | Floor Space, Inches | |
| 8 | 7 | 12 | 2.00 | 75 to | 125 | 300 to 500 | 11/2 | 2 | 6 | 5 | 79x28 | |
| 8 | . 8 | 12 | 2.61 | 75 " | 125 | 391 " 652 | | 2 | 6 | 5 | 82x35 | |
| 10 | 8 | 12 | 2.61 | 75 " | 125 | 391 " 652 | 2 | 21/2 | 6 | 5 | 82×35 | |
| 8 | 10 | 12 | 4.08 | 75 " | 125 | 612 " 1020 | 112 | 2 | ' 8 | 7 | 90x43 | |
| 10 | 10 | 12 | 4.08 | 75 " | 125 | 612 " 1020 | 2 | $2\mathfrak{t}_2$ | 8 | 7 | 90x43 | |
| 12 | 10 | 12 | 4.08 | 75 " | 125 | 612 " 1020 | 21/2 | 3 | 8 | 7 | 90x43 | |
| 14 | 10 | 12 | 4.08 | 75 " | 125 | 612 " 1020 | 21/2 | 3 | . 8 | 7 | 90x45 | |
| 10 | 12 | 12 | 5.87 | 75 " | 125 | 880 " 1468 | | 21/2 | 10 | 8 | 90x50 | |
| 12 | 12 | 12 | 5.87 | 75 " | 125 | 880 " 1468 | | 3 | . 10 | 8 | 90x56 | |
| 14 | 12 | 12 | 5.87 | 75 " | 125 | 880 " 1468 | $2\frac{1}{2}$ | 3 | . 10 | 8 | 90x56 | |
| 10 | 14 | 12 | 7.99 | 75 " | 125 | 1 2 00 " 2000 | + 2 | $2\frac{1}{2}$ | . 12 | 10 | 93x56 | |
| 12 | 14 | 12 | 7.99 | 75 " | 125 | 1200 " 2000 | | 3 | 12 | 10 | 93x56 | |
| 14 | 14 | 12 | 7.99 | 75 " | 125 | 1200 " 2000 | $12i\frac{\pi}{2}$ | 3 | 12 | 10 | 93 x 56 | |
| 16 | 14 | 12 | 7.99 | 75 " | 125 | 1200 " 2000 | 1 215 | 3 | 12 | 10 | 97x56 | |
| 12 | 14 | 18 | 12.00 | 50 " | 85 | 1200 " 2040 | $21\frac{7}{2}$ | . 3 | 12 | 10 | 122x50 | |
| 14 | 14 | 18 | 12.00 | 50 " | 85 | 1200 " 2040 | | 3 | 12 | 10 | 107x56 | |
| 16 | 14 | 18 | 12.00 | 50 " | 85 | 1200 " 2040 | | , 3 | 12 | 10 | 111x56 | |
| 12 | 15 | 18 | 13.77 | 50 " | 85 | 1377 " 2340 | | 3 | 12 | 10 | 1 2 6x5′ | |
| 12 | 16 | 18 | 15.67 | 50 " | 85 | 1567 " 266 | 3 21/ | 3 | 14 | 12 | 132x6 | |
| 14 | 16 | . 18 | 15.67 | 50 " | 85 | 1567 " 2 66 | | 3 | 14 | 12 | 132x6 | |
| 16 | 16 | 18 | 15.67 | 50 " | 85 | 1567 " 2663 | $3 \mid 21$ | 1 3 | 14 | 12 | 132x6 | |

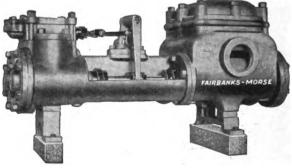
Any of the above pumps will be furnished brass fitted at a slight additional cost.

DUPLEX PUMPS

PISTON PATTERN LOW SERVICE OR TANK

For Water Pressures not Exceeding 75 Pounds

SIZE 6x5%x6



Pig. 5370A

| Steam s Inches | Be Be | | | a | PIPE SIZES FOR SHORT LENGTHS INCHES | | | | | |
|----------------------------|---|----------------------------|---|---|---|---|-------------------------------------|----------------------|--|---|
| Diam. of St Cylinders I | Diam. of W Cylinders | Length of Stroke Inches | Gals. per Strol of One Piston | Strokes per Minute of Each Piston | Gallons per Minute al Stated Number of Strokes | Steam | Exhaust | Suction | Discharge | Floor Space Inches |
| 3 *41/2 51/4 51/4 | 2½ 3¾ 4¼ 5 | 4 4 5 5 | .06 .19 .31 .42 | 100 to 200 100 " 200 100 " 150 100 " 150 | 12 to 24 38 " 77 62 " 93 84 " 126 | 1/2 1 1 | 1/2 3/4 11/4 11/4 | 114 212 3 4 | $\begin{array}{c} 1 \\ 2 \\ 2 \\ 3 \\ \end{array}$ | 29\\(\frac{11\}{2}\) 34\\(\frac{12}{2}\) 39\\(\frac{12}{2}\) 42\(\frac{18}{2}\) |
| *514 6 *6 | 5 ³ 4 5 5 ³ 4 | 5 6 6 | .56 .51 .67 | 100 " 150 100 " 150 100 " 150 | 112 " 168 102 " 153 134 " 201 | 1 1 1 | 1^{1} 1^{1} 1^{1} | 4 4 4 | 3 3 3 | 42x18 45x17 49x17 |
| *6 *7 *7 | 81 ₂ 6 7 | 6 7 7 | 1.48 .85 1.16 | 100 " 150 100 " 150 100 " 150 | 296 " 444 170 " 255 232 " 348 | $\begin{array}{c c} 1 \\ 1\frac{1}{2} \\ 1\frac{1}{2} \end{array}$ | $\frac{1}{2}$ | 6 5 6 | 5 4 5 | 53x23 ¹ 4 58x20 58x22 |
| 7 *7 | 6 7 | 10 10 | 1.22 1.66 | 75 " 150 75 " 150 | 183 " 366 249 " 498 | $\frac{1^{1}6}{1^{1}2}$ | $egin{array}{c} 2 \\ 2 \end{array}$ | 6 5 6 | 4 5 | 67x211/2 72x?4 |
| 8 *8 *8 | 6 7 814 | 12 12 12 | $ \begin{array}{c c} 1.47 \\ 2.00 \\ 2.94 \end{array} $ | 75 " 125 75 " 125 75 " 125 | 220 " 367 300 " 500 441 " 731 | $ \begin{array}{c c} 1\frac{1}{2} \\ 1\frac{1}{2} \\ 1\frac{1}{2} \end{array} $ | 2 2 2 | 5 6 6 | 4 5 5 | 70x22¼ 75x26 75x27 |

^{*}These sizes have suction opening on the side. All other sizes have suction opening on the end.

Our Piston Pattern Pumps of this type are especially designed for elevating water or other liquids, to a moderate height with a small consumption of steam.

For work where the head to be pumped against is not too high, they are, by reason of their cylinder proportions, more economical in consumption of steam than our general service pumps.

They have water pistons nearly or quite the diameter of their steam pistons, therefore cannot feed their own boilers; but when it is desired an auxiliary boiler feed pump may be attached for this purpose at small expense.

They are designed for use in connection with rallway water stations, breweries, distilleries, gas works, tanneries, oil works, bleacheries, refineries, etc.

DUPLEX PUMPS

PLUNGER AND RING PATTERN, FOR GENERAL SERVICE

For Water Pressures Not Exceeding 150 Pounds



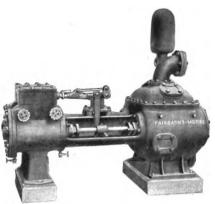


Fig. 5369A

| Diam. of Steam | Diam. of Water | Length | Capaci'y per Stroke | Strokes per Minute | Gallons per Minute | | Pipes Si rt Leng | | | Floor Space |
|--------------------------|--------------------------|------------------|------------------------------|-----------------------|-----------------------------------|-------------------|---------------------|--------------|----------------|----------------------|
| Cylin- ders Inches | Cylin- ders Inches | Stroke Inches | of One Plunger Gallons | of Each Plunger | at Stated Number of Strokes | Steam | Ex- haust | Suc- tion | Dis- charge | Inches |
| 10 | 6 | 12 | 1.47 | 75 to 125 | 220 to 367 | 2 | 21/2 | 5 | 4 | 78×32 |
| 12 | 6 | 12 | 1.47 | 75 " 125 | 220 " 367 | 21/2 | 3 | 5 | 4 | 78 x 32 |
| 10 | 7 | 12 | 2.00 | 75 " 125 | 300 " 500 | 2 | 21/2 | 6 | 5 | 78 x 33 |
| 12 | 7 | 12 | 2.00 | 75 " 125 | 300 " 500 | 21/2 | 3 ~ | 6 | 5 | 78 x 33 |
| 14 | 7 | 12 | 2.00 | 75 " 125 | 300 " 500 | $2\frac{1}{2}$ | 3 | 6 | 5 | 78 x 42 |
| 12 | 8 | 12 | 2.61 | 75 " 125 | 391 " 652 | 212 | 3 | 6 | 5 | 78 x 42 |
| 14 | 8 | 12 | 2.61 | 75 " 125 | 391 " 652 | 21% | 3 | 6 | 5 | 78 x 42 |
| 16 | 8 | 12 | 2.61 | 75 " 125 | 391 " 652 | 212 | 3 | 6 | 5 | 87 x 42 |
| 14 | 812 | 12 | 2.94 | 75 " 125 | 441 " 731 | 21% | 3 | 7 | 6 | 78 x 42 |
| 16 | 812 | 12 | 2.94 | 75 " 125 | 441 " 731 | 213 | 3 | 7 | 6 | 87 x 42 |
| 14 | 9 | 12 | 3.30 | 75 " 125 | 495 " 82 5 | $2\iota_2^*$ | 3 | 7 | 6 | 78 x 42 83 x 42 |
| 16 | 9 | 12 | 3.30 | 75 " 125 | 495 " 825 | 213 | 3 | 7 | 6 | |
| 18 | 9 | 12 | 3.30 | 75 " 125 | 495 " 825 | 3 ~ | 31_{2} | 8 8 | 7 | 90 x 48 86 x 48 |
| 16 | 10 | 12 | 4.08 | 75 " 125 | 612 " 1020 | 21, | 3 | 8 | 7 | 90 x 48 |
| 18 | 10 | 12 | 4.08 | 75 " 125 | 612 " 1020 | 3 ~ | 31,2 | 8 | 7 8 | 96 x 47 |
| 16 | 12 | 12 | 5.87 | 75 " 125 | 880 " 1468 | 3 | 312 | 10 | 8 | 92 x 53 |
| 18 | 12 | 12 | 5.87 | 75 " 125 | 880 " 1468 | . 3 | 312 | 10 | | 104 = 40 |
| 16 | 9 | 18 | 4.95 | 50 " 85 | 495 " 825 | 215 | 3 | 7 | 6 | 104 x 48 106 x 48 |
| 18 | 9 | 18 | 4.95 | 50 " 85 | 495 " 825 | $2^{\frac{1}{2}}$ | 3 | 7 | 1 | 100 x 48 |
| 16 | 10 | 18 | 6.12 | 50 " 85 | 612 " 1020 | 213 | 3 | , 8 | 1 | 104 x 48 |
| 18 | 10 | 18 | 6.12 | 50 " 85 | 612 " 1020 | | 312 | 1 8 | | 104×48 |
| 20 | 10 | 18 | 6.12 | 50 " 85 | 612 " 1020 | 4 | 5 | 10 | | 106 x 48 |

Any of the above pumps will be furnished brass fitted at a slight additional cost.

DUPLEX PUMPS

BOILER FEED, PISTON PATTERN

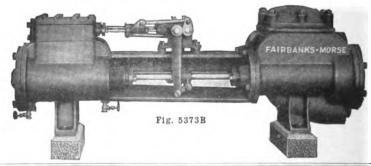
For Boiler Pressures Not Exceeding 150 Pounds-Size 6x4x6



| Steam | Water Inches | Stroke | Stroke | Bollers III Supply sy Speed | per Minute Piston | er Minute Strokes | Shor | Pipe Sizi T Lengt | es por us. Inci | IES | |
|--|---|--|--|---|----------------------------|------------------------------|---|---|--|--|---|
| Diam. of St Cylinder, 11 | Diam, of W Cylinder, 11 | Length of S Inches | Capacity in Gallons per Str of One Piston | H. P. of Bol Pump Will at an Easy | Strokes per of Each Pls | Gallons per at Stated Str | Steam | Exh g ust | Suction | Discharge | Floor Space Inches |
| 3 41 ₂ 514 6 7 7 7 7 * 8 *10 | 2 3 3 ¹ / ₂ 4 4 ¹ / ₂ 5 4 ¹ / ₂ 5 6 | 4 4 5 6 7 7 10 10 12 12 | .05 .12 .20 .33 .48 .59 .69 .85 1.02 | 100 200 400 550 700 800 950 1100 1300 1700 | | | 3 8 1 2 1 1 1 1 1 1 1 2 1 1 2 1 1 2 1 1 2 2 1 | 114 114 112 2 2 2 2 2 2 | 11/4 2 21/2 3 4 4 4 4 4 5 | 1 1½ 1½ 2 3 3 3 4 | 30 x11½ 35½x13½ 39½x16 45x17 50x20 50x20 72x23 72x23 76x26 82x28 |

^{*} Like general service, piston pattern.

GENERAL SERVICE, PISTON PATTERN For Water Pressures Not Exceeding 150 Pounds—Size 7x41/2x7



| x 26 | 76 | 3 | 4 | 2 | 11/6 | 99 to 165 | 75 to 125 | . 66 | 12 | 4 | 8 |
|--------|-----|---|---|------|------|-----------|-----------|----------|----|---|----|
| x 26 | 76 | 3 | 4 | 2 | 11/2 | 153 " 255 | 75 " 125 | 1.02 | 12 | 5 | 8 |
| ź x 26 | 761 | 4 | 5 | 2 | 11/2 | 153 " 255 | 75 " 125 | 1.02 | 12 | 5 | 10 |
| _x 2× | 82 | 4 | 5 | 21/2 | 2 | 220 " 367 | 75 " 125 | 1.47 | 12 | 6 | 10 |
| x 28 | 76 | 5 | 6 | 21/2 | 2 | 300 " 500 | 75 " 125 | 2.00 | 12 | 7 | 10 |
| x 32 | 78 | 5 | 6 | 3 | 21/2 | 300 " 500 | 75 " 125 | 2.00 | 12 | 7 | 12 |

10x6x12 and larger sizes are regularly fitted with air chambers.

DUPLEX BOILER FEED PUMPS

RAM PATTERN

For Boiler Pressures Not Exceeding 175 Pounds

SIZE 51, x314x5



Fig. 2040A

In this type of pump, the plungers being outside (i. e., externally) packed, are always in sight of the attendant engineer, and the stuffing box packing is easily adjusted, or replaced when necessary, without having to break joints or remove cylinder covers.

The element of slippage is reduced to a minimum in this type, and the volumetric efficiency is correspondingly increased.

These pumps are adapted for handling water at a high temperature, or water containing sand or grit, and for high pressure boiler feeding they offer many advantages.

| DIAMETER, INCHES | | Length of Stroke | Capacity per Stroke | II. P. Boil- ers Pump | | OF PIPE | | | |
|-------------------------------------|-------------------|---------------------|--------------------------------|--------------------------|---------|---------------------|--------------------------|----------------|-----------------------|
| Steam Cyilnder | Water Cylinder | | of One Pis- ton, Gallons | | Steam | Ex- haust | Suc- tion | Dis- charge | Fioor Space Inches |
| $\frac{4\frac{1}{2}}{5\frac{1}{4}}$ | 31/4 | 5 | .12 | 170 280 | 1/2 | 114 | $\frac{2}{2\frac{1}{2}}$ | 11/2 | 54 x15 63½x17½ |
| 6 7½ | 4 5 5 | 6 6 | .33 .49 | 470 670 | 1 1½ | $\frac{1}{2}^{1}$ 2 | 3 ~ 4 | 3 | 70 x1834 71 x23 |

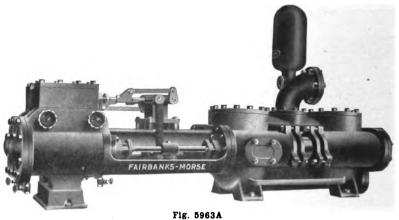
LIST OF PRINTED MATTER

We issue catalogues, pamphlets and circulars covering all of our different lines. If interested in any particular subject, as indicated, we shall be pleased to furnish special printed matter on request.

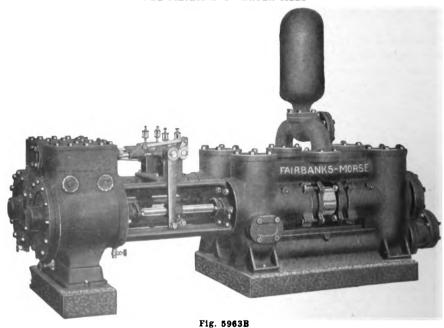
DUPLEX PUMPS

OUTSIDE CENTER PACKED PLUNGER

For Water Pressures up to 250 Pounds SIZE 10x6x12



SIZE 14x7x12 AND LARGER SIZES



Digitized by Google

PUMPS AND PUMPING ENGINES

COMPOUND DUPLEX OUTSIDE CENTER PACKED PLUNGER PUMP

SIZE 12-18 x 10 x 12

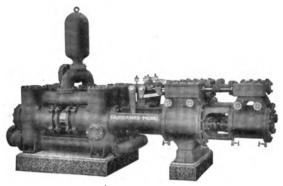


Fig. 2035A

TRIPLE EXPANSION PUMPING ENGINE WITH OUTSIDE CENTER PACKED PLUNGER WATER END

SIZE 15-24-40 x 15 x 24

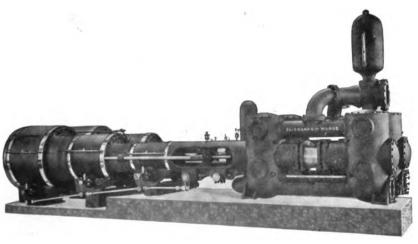
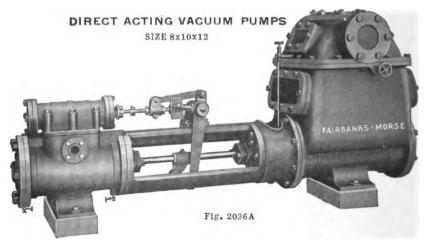


Fig. 2035B

PUMPS AND CONDENSERS



To meet the exacting requirements of an efficient vacuum pump, we offer the machine shown above. The steam mechanism is positive in operation and the design of the vacuum cylinder is such as will maintain steadily a high vacuum. A submerged stuffing box on the vacuum cylinder end of the piston rod prevents air from leaking into the cylinder around the rod and vitiating the vacuum. These pumps are intended for use in connection with evaporating effects for either the wet or dry system. Also in sugar refineries, chemical works, dye works, heating systems, surface condensers, keel condensers, etc.

Prices on application.

INDEPENDENT CONDENSING APPARATUS SIZE 8x10x12 The machine shown above is simple in design, yet embodies all necessary features to render it positive and durable in operation. The saving in steam effected by the use of an efficient condens-Correspondents should give complete information on the fol-

ing apparatus varies from 15 to 40 per cent, depending upon conditions.

lowing questions:

1. What is the type of engine—simple, compound or triple

expansion? 2. How many pounds of steam are to be condensed per hour? Or state diameter of engine cylinder, length of stroke, revolutions per minute, and maximum cut-off.

3. What is the steam pressure carried?

What is the maximum temperature of injected water?

5. What are the distances both vertically and horizontally from surface of injection supply to floor of room where condenser is to be located?

When desired, we can furnish these machines with compound steam ends.

Fig. 2036B

POWER PUMPS AND WELL ENGINES

ARTESIAN WELL ENGINE DUPLEX POWER PUMP PISTON PATTERN



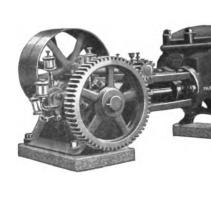


Fig. 2039A

Fig. 2039B

DUPLEX POWER PUMP PLUNGER AND RING PATTERN

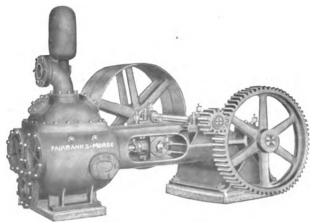


Fig. 2039C

DUPLEX PUMP AND VERTICAL BOILER

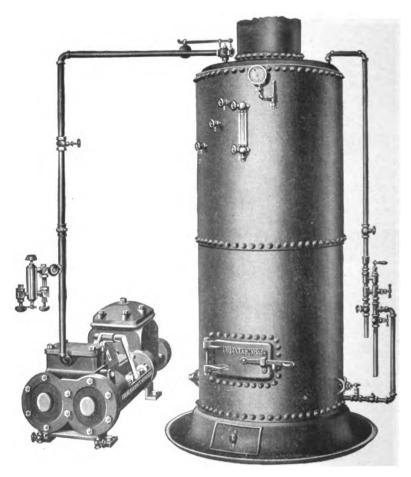


Fig. 2037A

For specifications and description see following page.

DUPLEX PUMP AND VERTICAL BOILER

The cut on preceding page illustrates a combination of our duplex steam pump with a vertical boiler, complete in itself with auxiliary boiler feed pump, or inspirator, boiler base, smoke box extension, grate bars, steam gauge, water gauge, gauge cocks, blow-off cock, safety valve, boiler feed connections, steam pipe and necessary fittings, etc. It is a most compact and serviceable outfit for supplying water for railway stations, hotels, public buildings, or for use in quarries, irrigating land and in all places where an independent pumping plant is desired.

It is light, compact and strong, and can be placed at the point of supply and the water forced to any distance and height required. It is easily understood and does not need a skilled mechanic to operate it.

The boilers are made of the best 60,000 T. S. steel, with fire-box flange steel in the furnace and heads. \cdot

Stack extra to order, when desired.

In addition to the sizes given in the above list a large number of combinations can be supplied to meet the requirements of any desired service.

The above sizes of boilers are those we commonly supply, although occasionally it is necessary for us to furnish boilers of slightly different dimensions, but of course of ample capacity to operate the pump.

| Siz | E OF Pt | мР | | | | Pipes, | Inches | | DIMENS | IONS OF | Boiler |
|--|--|--|--|--|---|---|--|---------------------------------|--|--|--|
| Diameter of Steam Cylinders, Inches | Diameter of Water Plungers, Inches | Length of Stroke. Inches | Gallons per Stroke of One Plunger | Strokes per Minute of Each Plunger | Steam | Exhaust | Suction | Discharge | Diameter of Shell, Inches | Height of Shell, Inches | Number of 2-inch Tubes |
| 3 41 2 514 6 6 7 7 8 8 8 8 10 10 10 12 | 2 3 3 4 5 5 6 7 8 6 7 8 | 4 4 5 6 10 10 12 12 12 12 12 12 12 12 12 | .65 .12 .20 .33 .51 .85 1.22 1.47 2.60 2.61 1.47 2.00 2.61 2.61 2.00 | 100 to 250 100 " 200 100 " 200 100 " 150 100 " 150 75 " 125 75 " 125 | 38 a 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | 1 2 2 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 | 14 212 3 4 4 5 6 6 6 6 6 | 1 1 4 5 2 3 3 4 3 4 5 5 5 5 5 5 | 24 24 30 30 36 36 36 36 36 36 36 36 36 36 36 | 60 60 72 72 72 72 72 72 84 84 84 84 96 96 | 31 31 49 49 61 61 61 61 61 61 61 79 |

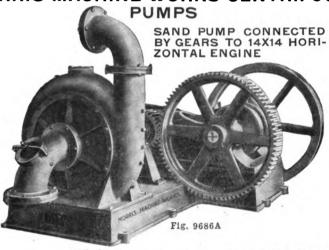
10-INCH HEAVY SERVICE DREDGING PUMP DIRECT CONNECTED 125-HORSE-POWER ELECTRIC MOTOR

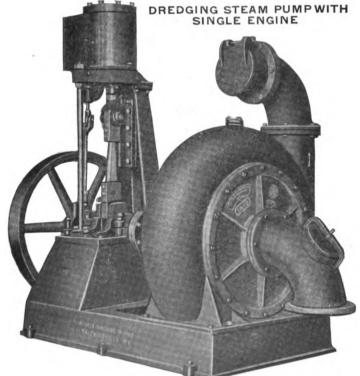


DO NOT CUT CATALOGUE, ORDER BY FIGURE NUMBER.

Digitized by Google

MORRIS MACHINE WORKS CENTRIFUGAL





Prices on application.

Fig. 9686B

NEW SPECIAL HYDRAULIC DREDGING AND SAND PUMPS



Fig. 7413A

| Number of | DIAMETE | R, INCHES | | GAL PER SOLIDS | | 101 130011 | Will Pass Solids | Diameter and Face | Floor Space | Weight |
|--------------|----------------|-----------|-----|-------------------|-----|----------------------|------------------------|----------------------|----------------|--------|
| Pump | Dis- charge | Suction | 10% | 15% | 20% | 10 Feet Elevation | 11:0 | Inches | Inches | Pounds |
| 4 | 4 | 4 | 14 | $\overline{21}$ | 28 | 4 | 2 | 12 x 12 | 40 x 31 | 980 |
| 6 | . 6 | 6 | 30 | 45 | 60 | 8 | 41/2 | 20 x 12 | 68 x 40 | 2125 |
| 8 | 8 | 8 | 60 | 90 | 120 | 15 | 6 | 24 x 14 | 72 x 48 | 3670 |
| 10 | 10 | 10 | 90 | 135 | 180 | 25 | 8 | 30 x 15 | 94 x 54 | 4975 |
| 12 | 12 | 12 | 125 | 190 | 250 | 30 | 10 | 36 x 20 | 114 x 66 | 7825 |
| 15 | 15 | 15 | 210 | 315 | 420 | 50 | 10 | 42 x 24 | 154 x 78 | 15200 |
| 18 | 18 | 18 | 300 | 450 | 600 | 70 | 10 | 48 x 30 | 160 x 80 | 16125 |

Prices on application.

NEW STYLE BELT DRIVEN PUMPS

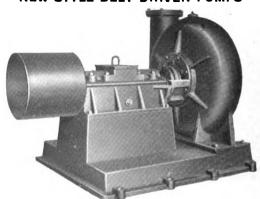


Fig. 7413B

DOUBLE SUCTION

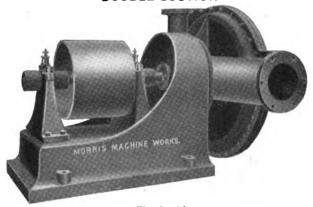


Fig. 5608A

1500 GALLONS PER MINUTE



Fig. 5608B

IMPROVED STANDARD HORIZONTAL RIGHT-HAND

PLAIN

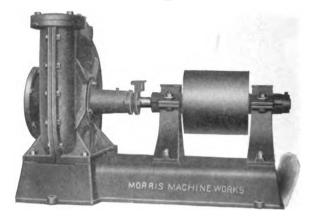


Fig. 8292A

WITH SUCTION PRIMER

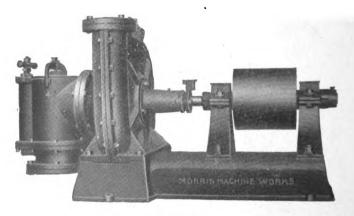


Fig. 8292B

See following page for table of dimensions, etc.

IMPROVED STANDARD IRON HORIZONTAL PUMPS

These pumps are used extensively for all purposes. They are very strong and solid. Have large diameter shaft running in long bearings lined with best babbitt metal. The pulley is large. Hub bearing is long and fitted with proper packing gland. All parts are accurately machine fitted. The pumps shown by cuts are right hand. They are furnished complete with all oilers and wrenches, and with suction and discharge flanges, threaded for standard wrought iron pipe, unless otherwise ordered. We furnish ring oiling bearings when desired.

Fig. 8292B shows the same pump with a suction primer added. There are several ways of priming, but the use of this primer affords the simplest means of doing it by hand. It consists of a large check valve and a hand pump which draws from below the valve and delivers above. Before starting the main pump, open the pet cock on top of the shell and work the primer (shown on extreme left) by hand until water spurts from the cock. The pump is then ready to start. Foot valve is unnecessary. We furnish these suction primers for pumps up to and including size 10. For larger pumps foot valve or flap valve and ejector are recommended.

| of in | <u> </u> | • | | | | WEIGHT | Pounds |
|---|--|---------------------------------|---|--|--|-------------------|----------------|
| Number of Pump and Diameter of Discharse Open- ing, Inches | Size Pipe Flange on Suction Inches | Capacity per Minute, Gallons | Horse Power for Each Foot Elevation | Diameter and Face of Puiley Inches | Floor Space without Primer Inches | Without Primer | With Primer |
| 112 | 2 | 70 | .058 | 6 x 6 | 17 x 31 | 175 | 220 |
| $\frac{13\tilde{4}}{2}$ | 2 3 3 | 90 | .075 | 7 x 8 | 21 x 32 | 260 | 305 |
| 2 | 3 | 120 | .10 | 8 x 8 | 23 x 37 | 350 | 415 |
| 2½ 3 4 5 6 8 10 | 3 | 180 | . 15 | 8 x 8 | 24 x 38 | 360 | 430 |
| 3 | 4 5 6 8 | 260 | .22 | 8 x 8 | 25 x 39 | 415 | 495 |
| 4 | 5 | 470 | .30 | 10 x 10 | 29 x 41 | 615 | 720 |
| 5 | 6 | 735 | .45 | 12 x 12 | 34 x 54 | 940 | 1075 |
| 6 | | 1000 | .59 | 15 x 12 | 37 x 55 | 1180 | 1345 |
| 8 | 10 | 2000 | 1.00 | 20 x 12 | 45 x 64 | 2065 | 2430 |
| 10 | 12 | 3000 | 1.52 | 24 x 12 | 51 x 69 | 2610 | 2940 |
| 12 | 15 | 4200 | 2.00 | 30 x 14 | 63 x 71 | 3615 | |
| *12 | 12 | 4200 | 2.00 | 20 x 12 | 51 x 59 | 2800 | |
| 15 | 18 | 7000 | 3.50 | 40 x 15 | 77 x 80 | 8250 | |
| *15 | 18 | 7000 | 3.50 | 30 x 15 | 60 x 68 | 3350 | |
| 18 | 20 | 10000 | 4.50 | 40 x 16 | 93 x 103 | 9000 | |
| *18 | 2 0 | 10000 | 4.50 | 30 x 16 | 66 x 72 | 5800 | |
| 20 | 22 | 12000 | 5.40 | 36 x 20 | 73 x 83 | 7000 | |
| *24 | 24 | 15000 | 6.50 | 48 x 20 | 90 x 98 | 10800 | |
| 24 | 24 | 15000 | 6.50 | 48 x 36 | 94 x 137 | | |



^{*}Refers to low lift pumps, which are recommended for elevation up to 25 feet. Illustrations shown on preceding page.

MOTOR-DRIVEN DIRECT-CONNECTED

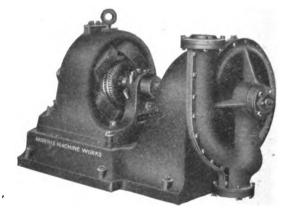


Fig. 6738A

MOTOR-DRIVEN HIGH LIFT FOR 100-FOOT ELEVATION

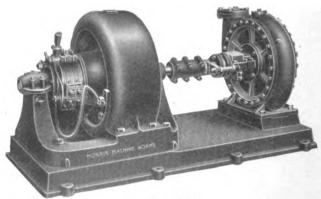


Fig. 6738B

In deciding on the type and size of Centrifugal Pump suited for any service, the ip formation which we require is much the same as in the case of a steam pump, since the lift is obtained by centrifugal force alone, the pump is not positive acting and the actual head is a more important consideration therefore, than in the case of a steam pump. The effect of pipe friction must also be carefully considered.

If direct-connected to motor, state voltage, and whether direct or alternating current.

VERTICAL





Fig. 5147A

SUCTION TYPE



Fig. 5147B

| Number Pump (Diameter Discharge Opening, Inches) | Economical Capacity per Minute, Gallons | Horse-Power Required for Each Foot Elevation | Diameter and Face of Pulley, Inches | Floor Space Required Inches | Distance from Bottom of Pump to Center Coupling, Inches | Coupling Bored for Connecting Shaft, Inches | Shipping Weight Submerged Type, Lbs. | Shipping Weight Suction Type, Lbs. | Price Extra Bearings, Each | Price Extra Coupling, Each | Price Submerged Type, Each | Price Suction Type, Each |
|--|--|--|--|--------------------------------|---|---|---|---------------------------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------|
| 11/2 | 70 | .058 | 5x 6 | 17x 21 | 33 | 1 | 110 | 135 | 1.00 | 1.50 | 40.00 | 62.00 |
| 134 | 90 | .075 | 6x 6 | 21x 29 | 36 | 1 | 165 | 200 | 1.00 | 1.50 | 50.00 | 78.00 |
| 1^{3}_{4} 2^{1}_{2} 3^{1}_{2} | 120 | .10 | 7x 8 | 23x 30 | 40 | 11/16 | 198 | 250 | 1.50 | 2.00 | 65.00 | 100.00 |
| $2\frac{1}{2}$ | 180 | .15 | 7x 8 | 24x 30 | 40 | 11/16 | 220 | 275 | 1.50 | 2.00 | 80.00 | 124.00 |
| 3 | 260 | .22 | 7x 8 | 25x 32 | 42 | 11/8 | 235 | 340 | 1.50 | 2.00 | 95.00 | 147.00 |
| 4 | 470 | .30 | 8x10 | 29x 39 | 48 | 17/16 | 380 | 495 | 2.00 | 2.50 | 110.00 | 170.00 |
| 4 5 6 8 10 | 735 | .45 | 10x10 | 34x 45 | 55 | 111/6 | 605 | 785 | 2.50 | 3.00 | 140.00 | 216.00 |
| 6 | 1050 | .59 | 12x12 | 37x 48 | 55 | 113/16 | 740 | 1050 | 3.00 | 3.50 | 170.00 | 285.00 |
| 8 | 2000 | 1.00 | 18x12 | 45x 56 | 65 | 2 | 1320 | 1710 | 4.00 | 4.00 | 265.00 | 445.00 |
| 10 | 3000. | 1.52 | 20x12 | 51x 68 | 65 | 2 | 1430 | 1925 | 4.00 | 4.00 | 330.00 | 550.00 |
| 12 12* | 4200 | 2.00 | 24x14 | 63x 72 | 72 | 23 8 | 2610 | 3000 | 5.00 | 5.50 | 420.00 | 700.00 |
| 12* | 4200 | 2.00 | 20x12 | 49x 62 | 45 | 256 | 2000 | 2500 | 5.00 | 5.50 | 370.00 | 650.00 |
| 15 | 7000 | 3.50 | 30x16 | 77x102 | 78 | 314 | 5500 | 6000 | 8.00 | 8.00 | 600.00 | 1000.00 |
| 15* | 7000 | 3.50 | 30x15 | 60x 71 | 78 | 314 | 2650 | 3100 | 8.00 | 8.00 | 480.00 | 800.00 |
| 18 | 10000 | 4.50 | 36x18 | 98x126 | 84 | 334 | 6000 | 7000 | 10.00 | 12.00 | 950.00 | 1585.00 |
| 18* | 10000 | 4.50 | 30x16 | 66x 78 | 78 | 31/4 | 2900 | 3300 | 10.00 | 12.00 | 850.00 | 1420.00 |
| 20 | 12000 | 5.40 | 36x20 | 73x 92 | 54 | 4 | 4500 | 5200 | 15.00 | 20.00 | 1255.00 | 2100.00 |
| 24* | 15000 | 6.50 | 48x20 | 88x110 | 72 | 41/2 | 8000 | 9000 | 20.00 | 25.00 | 2000.00 | 2800.00 |

^{*} Low Lift Pumps.

Pumps are furnished complete with discharge elbow, one pair couplings, pulley and one bearing.

TWO-STAGE TURBINE FOR IRRIGATION

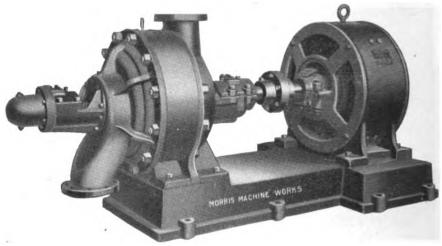
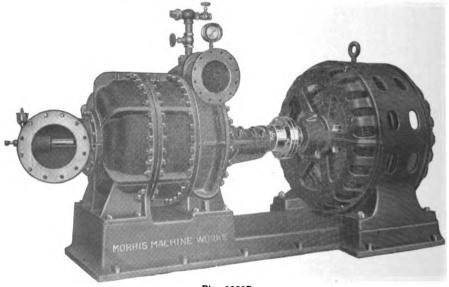


Fig. 6833A

Furnished in any size, belt-driven or direct connected to electric motor. Prices on application.

THREE-STAGE MOTOR-DRIVEN HIGH PRESSURE FOR WATER WORKS



Prices on application.

Fig. 6833B

WHEN ORDERING BY FIGURE NUMBER, PLEASE GIVE THE PAGE NUMBER ALSO. MORRIS MACHINE WORKS CENTRIFUGAL PUMPS

DIAGRAM OF DIFFERENT POSITIONS OF SUCTION AND DISCHARGE, SHOWING OUTER HALF OF PUMP SHELL

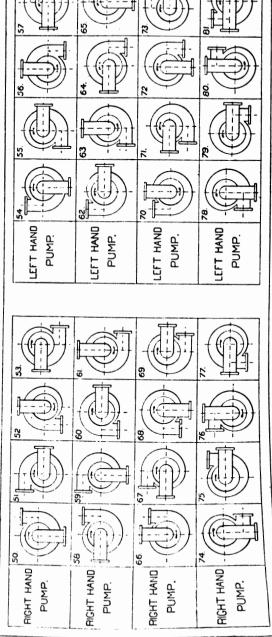
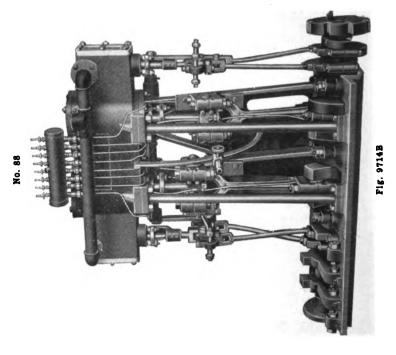
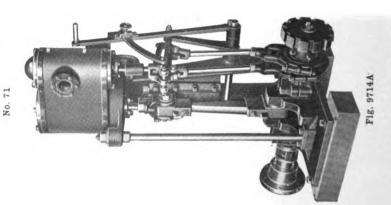


Fig. 8796A

direwiter receipt be made Nos. 51, 52, or 53. Figure 5608A shows pump made per diagram No. 58 and is right hand. This pump can be made, by swiveling around the frame, into Nos. 59, 60 or 61. When no diagram number is designated in ordering double-suction pumps we will send No. 50. Before ordering pump determine which position will best suit your requirements as regards rotation of shaft and connection In viewing diagrams above you are supposed to stand at the outer half of pump shell looking over pump towards the pulley or engine, if with suction and discharge pipes so as to get the most direct pipes with the least number of elbows or bends.

MORRIS MACHINE WORKS MARINE ENGINES





Prices and further information on application.

Digitized by Google

MORRIS MACHINE WORKS DREDGING MACHINERY

12×12 DOUBLE HEAVY DUTY CUTTER ENGINE FOR HYDRAULIC DREDGE

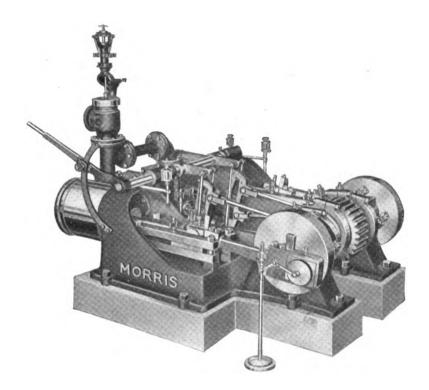


Fig. 956A

MORRIS MACHINE WORKS DREDGING MACHINERY



Fig. 954A Prices on application.

MORRIS MACHINE WORKS EJECTORS AND VALVES



FLAP VALVE



Fig. 2714A

Fig. 2714B

EJECTORS

These ejectors are used in priming or charging pumps when steam can be obtained. A flap valve, enclosed, flap valve or foot valve, as shown, is used in connection with the ejector.

FLAP VALVES

Used on end of discharge pipe to prevent air from entering pipe when using ejector. Open and close automatically.

ENCLOSED FLAP VALVE



Fig. 2714C

FOOT VALVE



Fig. 2714D

ENCLOSED FLAP VALVES

Serve the same purpose as flap valve shown above, but are placed between pump and discharge pipe.

FOOT VALVES

These valves are placed at bottom of suction pipe to hold column of water and keep pump primed. Strainer is not furnished unless ordered.

O. & S. CLASS A VERTICAL ENGINES

CENTER CRANK









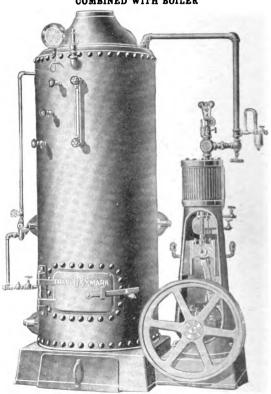


Fig. 9400B

| Horse Power | $1\frac{1}{2}$ | 3 | 5 | 7 | 10 | 14 |
|--------------------------------|--------------------------|--------------|--------|---------------|------------------|-------------|
| Size of Cylinder inches | 3×3 | 4 x 4 | 5 x 5 | 6 x 6 | 7 x 7 | 8 x 8 |
| Revolutions per Minute | 300 | 250 | 250 | 200 | 190 | 180 |
| Steam Pipeinches | $\frac{1}{2}\frac{2}{2}$ | 34 | 34 | 1 | 114 | 11/2 |
| Exhaust Pipe " | 34 | 1 | 1 | 114 | 112 | 2° |
| Diameter of Shaft " | 1^{3}_{16} | 176 | 11116 | 1^{15}_{16} | 25°_{8} | 2136 |
| " "Fly Wheel " | 12 | 16 | 20 | 24 | 32 | 36 |
| Face of Fly Wheel " | 3 | | 5 | 6 | 7 | 8 |
| Floor Space, Plain Engine | 12^{1} | 13^{1}_{2} | 15 | 18 | 24 | 27 |
| Weight, Plain Enginepounds | 300 | 400 | 550 | 900 | 1400 | 1800 |
| " Comb. " " | 650 | 1600 | | | | |
| Price, Plain, Engineeach | | | | | | |
| " " and Trimmings " | 87.00 | 131.00 | 163.00 | 202.00 | 272.00 | 356.00 |
| " Combined Engine and Boiler " | 160.00 | 260,00 | 310.00 | 410.00 | 510.00 | 060,00 |



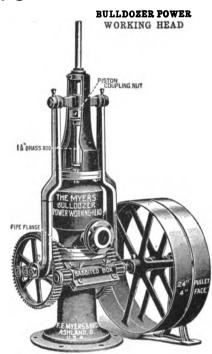


Fig. 6059A

Fig. 6059B BACK GEARED WORKING HEADS

| Number | 357 |
|---------------------------|------------|
| Length of Strokeinches | 5, 712, 10 |
| Tight and Loose Pulleys " | 16 |
| Suction and Discharge | 21/6 |
| Priceeach | 40′.00 |

BULLDOZER POWER WORKING HEADS

| Number | | 359 |
|-------------------------|--------|-------------|
| Length of Stroke | inches | 5, 71/6, 10 |
| Tight and Loose Pulleys | | 24 |
| Suction Pipe Connection | | 2 to 4 |
| Discharge " " | 44 | 21% to 3 |
| Price | | 75.00 |

SPEED ELEVATION AND HORSE POWER REQUIRED - No. 359

| Diameter Cylinderinches | 21/2 | 3 | 31/2 | 4 | 41/2 | 5 | 6 |
|-------------------------|------|-----|------|------|------|------|----|
| Elevation feet | 300 | 250 | 200 | 150 | 125 | 100 | 90 |
| Horse Power Required | 2 | 2 | 2 | 21/4 | 21/2 | 23/4 | 3 |

Will raise water 250 feet. Should be run not over 35 revolutions per minute, and less on deep wells.

BULLDOZER POWER PUMPS

WITH MACHINE CUT GEARS

Nos. 502 and 504

No. 362 and 353



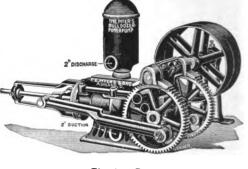


Fig. 2055A

Fig. 2055B

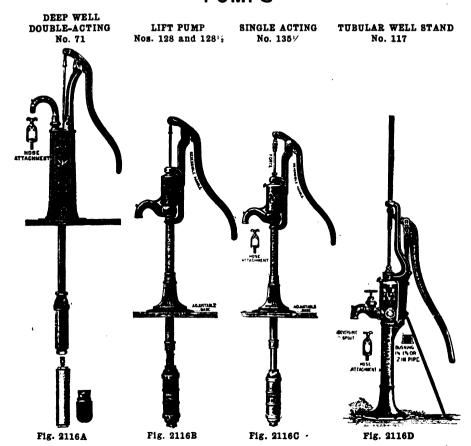
| Number | 502 | 504 | 362 | 353 | 352 | 363 |
|--------------------------|---------|--------|------------|---------------|--------|----------|
| Cylinderinches | 3 | 5 | 3 | 5 | 6 | 6 |
| Stroke " | 5 | 5 | 5, 712, 10 | 5 | 10 | 12,16,20 |
| Suction " | 11/2 | 2 | 2 | 2 | 3 | 4 |
| Discharge | 114 | 2 | 2 | 2 | 3 | 4 |
| Tight & Loose Pulleys " | 14 x 2½ | 16 x 4 | 16 x 4 | 16×4 | 24 x 4 | 30 x 6 |
| Capacity per Hourgallons | | 2000 | 1400 | 2000 | 5800 | 7200 |
| Priceeach | 70.00 | 85.00 | 80.00 | 80.00 | 175.00 | 250.00 |

HORSE POWER REQUIRED

| Elevation Feet | Horse Power Required | | | | | | | | | |
|-------------------|----------------------|---------|---------|---------|---------|---------|--|--|--|--|
| | No. 502 | No. 504 | No. 362 | No. 353 | No. 352 | No. 363 | | | | |
| 25 | j. | 3/4 | 3/4 | 3/4 | . 11/4 | 4 | | | | |
| 50 | 2 | 1 | 7/6 | 1 4 | 2 | 5 | | | | |
| 75 | 1 , | 11/4 | 1 0 | 11/4 | 3 | 6 | | | | |
| 100 | 3/4 | 115 | 11/4 | 11/2 | 4 | 7 | | | | |
| 150 | 1 | 2 | 11% | 2 | 5 | 9 | | | | |

The Bulldozer Power Pump is constaucted with special reference to power, strength and capacity.

The entire pump is mounted on one base, making it easy to set under all conditions. The special feature is the double machine cut gear, which is practically two sets of gears transmitting power to the piston rod in two lines, one from each end of the main shaft, giving a decided advantage over all other constructions.



| Number | 71 | 128 | 1281/2 | 1351/2 | 117 |
|------------------------------|------------|------|--------|--------------------------|----------|
| Size of Cased Wellinches | 3 | | | | |
| Depth of Wellfeet | 25 to 150 | | | | |
| Size of Lower Cylinderinches | 21/2 | 3 | 3 | $\frac{3}{1\frac{1}{4}}$ | • • • • |
| Tapped for Iron Pipe " | 1)4 306 | 1!4 | 11/4 | 11/4 | 2 |
| Capacity, per Hour gallons | 306 | 440 | 440 | 440 | |
| Priceeach | 16.00 | 7.00 | 8.00 | 9.00 | 9.00 |

No. 71 Anti-Freezing Pumps, with brass upper and lower cylinders, with latest improved glass valve seats held with brass follower. Capped inside.

Each pump fitted with hose attachment and strainers. Upper cylinder 4½ feet below platform.

No. 128, brass lined cylinder with iron seat. Adjustable base, 4-foot set lengths.

No. 12812, brass lined cylinder with glass seat. Adjustable base, 4-foot set lengths. No. 13512, brass-lined cylinder with glass seat. Adjustable base, 4-foot set lengths. No. 117, windmill head, 6, 8 and 10-inch stroke. Tapped for 2-inch pipe and bushed

for 11/2 or 11/2-inch. Has cock spout.

FORCE PUMPS LIFT PUMPS Medium Standard Air Chamber on Stock Air Chamber on Spout Heavy Standard

Fig. 4420A

Fig. 4420B

Fig. 4420C

Fig. 4420D

LIFT PUMPS

| | | | HEAVY STANDARD MED | | | MEDIUM | STANDARD |
|-------------|---|---|--------------------|--------------------------------|--|--------------------------------|--|
| Num- ber | Cylinder Inches | Suction Inches | Stroke Inches | Price Iron Cylinder Each | Price Brass Lined Cylinder, Each | Price Iron Cylinder Each | Price Brass Lined Cylinder, Each |
| 3 4 6 | $ \begin{array}{cccccccccccccccccccccccccccccccccccc$ | $\frac{\frac{11_{4}}{11_{4}}}{\frac{11_{2}}{12_{2}}}$ | 6 6 6 | 9.50 9.75 10.75 | 12.00 12.25 13.75 | 9.00 9.25 | 11.50 11.75 |

FORCE PUMPS

| | | | | AIR CHAMBI | ER ON STOCK | AIR CHAMBER ON SPOUT | | |
|-------------|--------------------|-------------------|------------------|--------------------------------|--|--------------------------------|--|--|
| Num- ber | Cylinder Inches | Suction Inches | Stroke Inches | Price Iron Cylinder Each | Price Brass Lined Cylinder, Each | Price Iron Cylinder Each | Price Brass Lined Cylinder, Each | |
| 3 | 23/4 x 10 | 11/ | 6 | 12.75 | 15.25 | 14.75 | 17.25 | |
| 4 | 3 x 10 | 117 | 6 | 13.00 | 15.50 | 15.00 | 17.50 | |
| 6 | 3½ x 10 | 112 | 6 | 14.00 | 17.00 | 16.00 | 19.00 | |

Lift pumps are anti-freezing, and for wells 30 feet deep. The pumps as listed are 4 feet long from base to bottom of cylinder.

Force pumps with air chambers are anti-freezing, and are for wells 30 feet deep. The pumps as listed are 4 feet long from base to bottom of cylinder.

"CHALLENGE" DOUBLE-ACTING FORCE PUMPS
SINGLE LEVER
DOUBLE LEVER



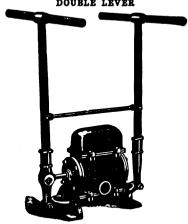


Fig. 1471 A

Fig.1471B

| 1 . | er, | | | rge, | PRICE, SINGLE LEVERS, EACH | | | PRICE, DOUBLE LEVERS, EACH | | | |
|-------------------------|-------------------|----------------------------|---------------------------|--|---|--|---|-------------------------------|--------------------------|----------------------------|--|
| Number | Cylindo Inches | Stroke, Inches | Suction Inches | Discharge, Inches | Brass Lined Cylinder | Brass Cylinder | * Brass | Brass Lined Cylinder | Brass Cylinder | * Brass | |
| 2 4 8 12 16 | 2½ 3 4 5 | 4½ 4½ 4½ 5¼ 5¼ | 1½ 1½ 1½ 2 2½ | $ \begin{array}{c c} 1 \\ 1 \\ 1^{1}_{4} \\ 1^{1}_{2} \\ 2 \end{array} $ | 27.00 28.00 30.00 40.00 50.00 | 55.00 55.00 60.00 90.00 120.00 | 75.00 75.00 90.00 150.00 185.00 | 35.00 45.00 55.00 | 65.00 95.00 125.00 | 100.00 155.00 195.00 | |

^{*}Brass Pumps are made entirely of brass, except levers, links, and bolts.

"THRESHER" DOUBLE-ACTING FORCE PUMPS



Fig. 1471C

| Cylinder Inches | Stroke Inches | *Suction Inches | Discharge Inches | Price, with Strainer Each |
|---|----------------------------------|---|---|---------------------------------|
| 5 | 5 | 2 | 1 | 18.00 |
| tion Hocharge I and Noz Pump, with tion Hocharge I and Noz Pump, with tion Hocharge I and Noz Pump, with tion Hocharge I and Noz Pump, with | se, 12½ f flose, Coup izle | inch Spiral eet 1-inch lings, Suctioa inch Spiral eet 1-inch lings, Suctioa inch Spiral eet 1-inch lings, Suctioa inch Spiral | 3-ply Dis- on Strainer Il complete Wire Suc- 3-ply Dis- on Strainer Il complete Wire Suc- 3-ply Dis- on Strainer Il complete Wire Suc- | 40.00 45.00 50.00 |
| charge I | Iose, Coup zle | lings, Suctiona | on Strainer | 54.00 |

* Hose or Pipe.

CLOSED TOP



Fig. 4419A

PITCHER SPOUT PUMPS

These pumps are for use in shallow wells, cisterns, or drive wells. The bearer top is secured to the cylinder with a set screw, which permits the lever to be turned in any desired direction. Furnished for lead or iron pipe as ordered.



Fig. 4419B

| Number | Cylinder Inches | Suction Inches | Stroke Inches | Price, Iron Each | Price, Porce- lain, Each | Price, Brass Lined, Each |
|--------|--------------------|-------------------|------------------|---------------------|-----------------------------|-----------------------------|
| 1 | $2\frac{1}{2}$ | 1 | 4 | 4.25 | | 6.50 |
| 2 | 3 | 11/4 | 4 | 4.75 | 7.25 | 7.25 |
| 3 | $3\frac{1}{2}$ | 14 | 4 | 5.25 | | 8.00 |
| 4 | 4 | $1\frac{1}{2}$ | 4 | 6.25 | • • • • | 9.00 |
| 5 | 41/2 | 2 | 5 | 9.50 | | 12.50 |
| 6 | 5 | 2^{1} | 5 | 17.00 | | 22.50 |

Brass lined pumps have galvanized plunger and rods Porcelain lined pumps have open top, and galvanized plunger and rods,

ON BASE



Fig. 4419C

CISTERN SUCTION PUMPS

These pumps are for suction lift of 25 feet. The cylinder is bolted to base. The bearer top is secured by set screw which permits the lever to be turned in any desired direction. Furnished for lead or iron pipe as ordered.



Fig. 4419D

| | | | | On | Base | WITH BRACKETS | | |
|-------------|--------------------|-------------------|------------------|-----------------------|---------------------------------|-----------------------|---------------------------------|--|
| Num- ber | Cylinder Inches | Suction Inches | Stroke Inches | Price Iron Each | Price Brass Lined Each | Price Iron Each | Price Brass Lined Each | |
| 0 | 2 | 1 | 5 | 4.00 | 6.00 | 3.50 | 5.50 | |
| 1 | 214 | 1 | 6 | 4.50 | 6.50 | 4.00 | 6.00 | |
| 2 | 213 | 1!4 | 6 | 5.00 | 7.00 | 4.50 | 6.50 | |
| 3 | 237 | 11, | 6 | 5.75 | 8.00 | 5.00 | 7.25 | |
| 4 | 3 | 111 | 6 | 6.25 | 8.75 | 5.50 | 8.00 | |
| 5 | 317 | 11., | 6 | 6.75 | 9.75 | 6.50 | 9.50 | |
| 6 | 313 | 115 | 6 | 8.00 | 11.50 | 8.00 | 11.50 | |

Brass cylinder pumps have brass plungers.

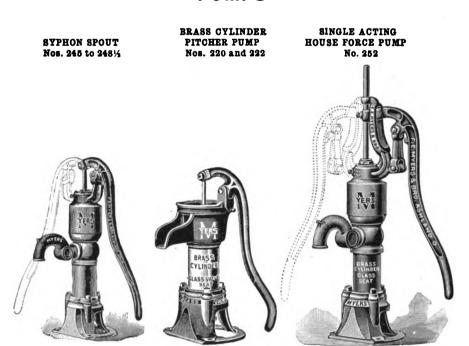


Fig. 2115A

Fig. 2115B

Fig. 2115C

| Number | 245 | •246½ | 247 | *2481/2 | 220 | 222 | 252 |
|----------------------------|------|-------|------|---------|------|------|------|
| Size, Brass Cylinderinches | 3 | | 31/2 | | 3 | 31/2 | 3 |
| " Polished Iron Cylinder " | | 3 | | 31/2 | | | |
| Tapped for Iron Pipe " | 11/4 | 1!4 | 11/2 | 11/2 | 11/4 | 11/2 | 11/4 |
| Price, Brass Cylindereach | 5.50 | | 6.50 | | 5.00 | 6.00 | 8.00 |
| " Polished Iron Cylinder " | | 4.00 | | 5.00 | | | •••• |
| | 1.00 | 1.00 | | | | | |

^{*}These pumps have plain valve seat.

All others are fitted with patent glass valve seat and drop valve, which allows water to drop and prevents freezing.

The House Lift Pumps with Syphon Spout throw a continuous stream. Have reservoir at top. Handle is reversible. Have steel piston rods and bolts.

Brass Cylinder Pitcher Pumps are made with seamless drawn brass cylinder, glass seat, rubber fibre check and revolving top. Base is attached to cylinder by three bolts.

Single acting house force pumps are titted with seamless drawn brass cylinder and patent glass valve seat, reversible handle, drawn steel piston rod, brass packing nut and steel bolts. Plunger will drop water to prevent freezing.

PUMPS HOUSE FORCE PUMPS

ON BASE



Fig. 8180A

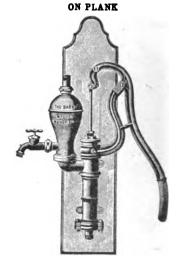


Fig. 81801

ON BASE

| Number | Cylinder Inches | Suction and Discharge Inches | Stroke Inches | Price Iron Cylinder Each | Price, Brass Lined Cylin- der, Each | Price Brass Cylinder Each |
|--------|--------------------------|------------------------------------|------------------|--------------------------------|---|---------------------------------|
| 1 | 2 | 114 | 6 | 12.00 | 14.50 | 16,50 |
| 2 | $2\frac{1}{2}$ | 114 | 6 | 12.50 | 15.00 | 17.00 |
| 3 | 3 | 114 | 6 | 14.50 | 17.00 | 19.50 |
| 4 | $31_{	ilde{2}}^{\times}$ | 11/2 | 8 | 21.50 | 25.00 | 28.50 |
| - 5 | 4 | 2 | 8 | 22.50 | 27.50 | 34.50 |

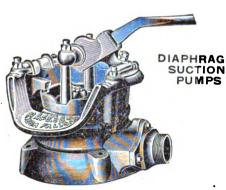
ON PLANK

| Number | Cylinder Inches | Suction and Discharge In hes | Stroke Inches | Price Iron Cylinder Each | Price, Brass Lined Cylin- der, Each | Price Brass Cylinde: Each |
|--------|------------------------|------------------------------------|------------------|--------------------------------|---|---------------------------------|
| 1 | f 2 | 1^14 | 6 | 12.00 | 14.50 | 16.50 |
| 2 | $2^{1}{}_{2}^{\prime}$ | $1^{1}4$ | 6 | 12.50 | 15.00 | 17.00 |
| 3 | 3 | $1^{1}\stackrel{\circ}{_4}$ | 6 | 14.50 | 17.00 | 19.50 |
| 4 | $3^{1}{}_{2}^{\times}$ | 112 | 8 | 21.50 | 25.00 | 28,50 |
| 5 | 4 | 2 | 8 | 22.50 | 27.50 | 34.50 |

Furnished without plank at .50 less list.

SIDE SUCTION





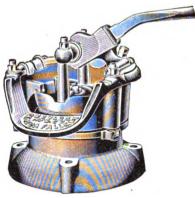


Fig. 1064A

Fig. 1064B

| Number | Suction, Inches | Capacity per Hour Gallons | Price, Side Suction for Hose, Each | Price, Bottom Suc- tion for Pipe, Each |
|--------|-----------------|------------------------------|---------------------------------------|---|
| 2 | 21_{2} | 1800 | 21.50 | 17.50 |
| 3 | 3 | 3500 | 24.00 | 20.00 |
| 4 | 4 | 6000 | 45.00 | 35.00 |
| | | | | |

SIDE SUCTION

BOTTOM SUCTION



CONTRACTORS SUCTION PUMPS



Fig. 1064C

Fig. 1064D

SIDE SUCTION

| Diameter Cylinder | Stroke | Capacity per Stroke | Lift | Suction, Inches | Price, Brass |
|-------------------|--------|---------------------|------|------------------|--------------|
| Inches | Inches | Gallons | Feet | , suction, menes | Lined, Each |
| 6 | 41, | .55 | 20 | 21., | 24.00 |
| 8'4 | 613 | 1.60 | 20 | 3 | 31.00 |

BOTTOM SUCTION

| Cylinder Inches | Suction Inches | Stroke Inches | Capacity per Stroke Gallons | Lift, Feet | Price, Bottom Suction, Each | Price, Side Suc- tion, Each |
|--------------------|-------------------|------------------|-----------------------------------|------------|--------------------------------|--------------------------------|
| 6 | $\frac{21}{3}$ | 41 ₂ | .55 | 20 | 23.00 | 24.00 |
| 81.g | | 613 | 1.60 | 20 | 30.00 | 31.00 |

RUMSEY FORCE PUMPS



No. 196 HAND ROTARY

No. 197 POWER ROTARY







Fig. 8640B

Fig. 8640C

No. 275 EXCELSIOR DOUBLE ACTING

| | PISTON, | Inches | Capacity | PIPE SIZ | E, INCHES | | H | |
|--------|----------|----------------|---------------------------|----------------|-----------|-------------------------|-------------------|--------|
| Number | Diameter | Stroke | per Revolution Gallons | Suction | Discharge | Brass Lined Cylinder | Brass Cylinder | *Hrass |
| 1 | 3 | 5 | .30 | 11/4 | 1!4 | 28.00 | 55.00 | 75.00 |
| 2 | 4 | 5 | .54 | 2 | 2 | 30.00 | 60.00 | 90.00 |
| 3 | 5 | $5\frac{1}{2}$ | .93 | $2\frac{1}{2}$ | 21/2 | 40.00 | 90.00 | 150.00 |
| 4 | 6 | 51/2 | 1.34 | $2\frac{1}{2}$ | 21/2 | 50.00 | 120.00 | 185.00 |

^{*}All parts brass except lever, links, and bolts.

No. 196 HAND ROTARY

| | Pipe Size | Capacity 100 | PRICE, EACH | | | |
|--------|----------------------|----------------------------|-------------|-------------------------|---------|--|
| Number | Fitted For Inches | Rev. per Minute Gallons | Iron | Bronze Case and Cams | *Bronze | |
| 1 | 11/4 | 13 | 19.00 | 41.00 | 51.00 | |
| 2 | 11/2 | 25 | 22.00 | 46.00 | 56.00 | |
| 4 | 2 | 29 | 35.00 | 64.00 | 86.00 | |

^{*}All parts coming in contact with the liquid are of bronze.

No. 197 POWER ROTARY

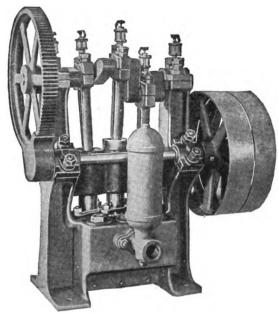
| | PE SIZE, INCHES | Capacity 100 Rev. | Size | | | | |
|--------|-----------------|-------------------|-----------------------|-------------------|-------|-------------------------|---------|
| Number | Suction | Discharge | per Minute Gallons | Pulleys Inches | Iron | Bronze Case and Cams | *Bronze |
| 1 | 114 | 1 | 13 | 7 x 2½ | 27.00 | 49.00 | 60.00 |
| 2 | 11/2 | 114 | 25 | 7 x 21% | 32.00 | 56.00 | 65.00 |
| 4 | 2 | 2 | 29 | 12 x 31/4 | 48.00 | 78.00 | 100,00 |
| 5 | 21/2 | 2 | 43 | 15 x 31/4 | 54.00 | 90.00 | 120.00 |

^{*}All parts coming in contact with the liquid are of bronze.

RUMSEY TRIPLEX PUMPS

SINGLE-GEARED

FOR ELEVATIONS UP TO 350 FEET OR 150 POUNDS PRESSURE
No. 681



Pig. 8641A

These pumps are triplex and have single-acting plungers; outside packed, with cross heads and guides, for general tank supply, boiler feeding, etc., and are regularly furnished for pumping cold water. They are fitted for pumping hot water or other fluids, to order, and are readily adapted to a variety of service. The design and construction are plain, durable, and efficient. Valves, packings and working parts are readily accessible. Gearing is machine cut. Bearings are babbitted and have reliable oiling devices. Regular valve construction is of bronze, with rubber discs, but bronze disc valves are furnished when specified. Plungers are iron. Bronze plungers and bronze fitted cylinders and glands to order, at extra price.

| PLUNGER: | PLUNGERS, INCHES | | Capacity at 40 | Working | PIPE SIZ | Size, Tight | |
|----------|------------------|------------------------|-----------------------------------|--------------------|----------|-------------|------------------------------|
| Dlameter | Stroke | Crank Shaft Gallons | to 60 Rev. per Minute, Gallons | Pressure Pounds | Suction | Discharge | and Loose Pulleys, Inches |
| 11/4 | 2 | .03 | 1.2 to 1.8 | 150 | 1 | 3/4 | 12 x 11/2 |
| 134 | 3 | .09 | 3.6 " 5.4 | 150 | 1 | 1 | 12 x 2 |
| 2 | 3 | . 12 | 4.8 " 7.2 | 130 | 11/4 | 114 | 12 x 2 |
| 21/4 | 4 | .20 | 8 " 12 | 150 | 134 | 11/4 | 12 x 21/2 |
| 3 | 41/2 | .41 | 16 " 24 | 150 | 11/2 | 11/2 | $15 \times 21\sqrt{3}$ |
| 31/2 | 5 - | .62 | 25 " 37 | 150 | 2 2 | 2 | 20 x 3 |
| 4 | 6 | 1.00 | 40 " 60 | 150 | 21/2 | 2 | 20 x 4 |
| 41/2 | 6 | 1.24 | 49 " 74 | 120 | 3 | 21/2 | 20 x 4 |
| 5 | 6 | 1.53 | 61 " 91 | 150 | 3 | 3 | 24 x 5 |

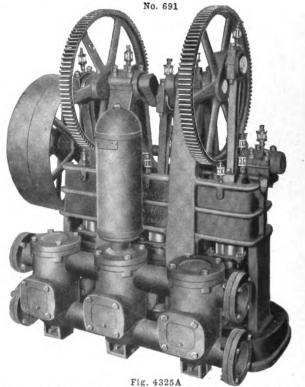
Prices on application

Gear ratio 5 to 1.

RUMSEY TRIPLEX PUMPS

DOUBLE GEARED

FOR ELEVATIONS OF 230 TO 350 FEET OR 100 TO 150 POUNDS PRESSURE



These pumps are triplex and have single-acting plungers, outside packed and outside guided. The frame, cast solid with the base, is exceptionally rigid, insuring permanent alignment of working parts. The gearing is machine cut from solid. The valve boxes and waterways are of ample size to prevent any loss from friction. The shaft bearings are babbitted and the connecting rods are fitted with adjustable phosphor bronze boxes at both ends. The cross head shoes are bronze and adjustable. The regular construction is iron plungers, cylinders and glands, and rubber disc valves working on bronze guides and seats. Bronze disc valves furnished when specified. Bronze plungers, bronze bushed cylinders and glands furnished to order at extra price.

| Plungers, Inches | | | | Working | | | Size Tight |
|------------------|--------|------------------------|-----------------------------------|--------------------|---------|-----------|----------------|
| Diameter | Stroke | Crank Shaft Gallons | to 60 Rev. per Minute, Gallons | Pressure Pounds | Suction | Discharge | Pulleys,Inches |
| 5 | 8 | 2 | 80 to 120 | 150 | 31/4 | 3 | 30x5 |
| $51/_{2}$ | 8 | 2.46 | 98 " 147 | 125 | 31/2 | 3 | 30x5 |
| 6 | 8 | 2.93 | 117 " 175 | 100 | 4 | 31/2 | 30x5 |
| 61/2 | 10 | 4.3 | 170 " 260 | 150 | 5 | 4 | 36x6 |
| 711 | 10 | 5.35 | 214 " 321 | 125 | 6 | 5 | 36x6 |
| 8 | 10 | 6.5 | 260 " 390 | 100 | 6 | 5 | 36x6 |

Prices on application. Gear ratio 5 to 1.

RUMSEY TRIPLEX PUMPS

SINGLE-GEARED

FOR ELEVATIONS 125 TO 200 FEET

No. 692

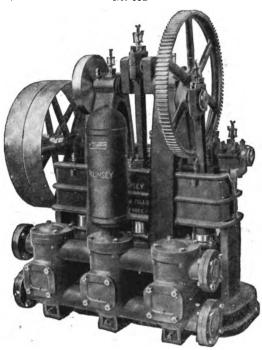


Fig. 4565A

These pumps are designed for tank pumping, general water supply, circulating fluids, pumping to condensers, and similar service. The frame is of improved design, perfectly rigid, insuring accurate alignment of all working parts. The bearings are babbitted, gearing machine cut from solid. Long connecting rods and broad cross head shoes traveling in bored ways prevent side wear on the stuffing boxes. The valve boxes and waterways are of ample size to prevent undue friction. All valves and stuffing boxes are easily accessible. Valve seats and stems are bronze. Suction and discharge connections can be made on either side.

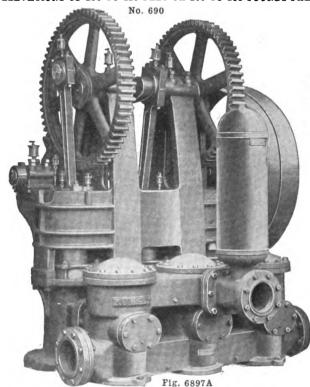
These pumps are regularly fitted with rubber disc valves for cold water, but can be fitted for hot water or other fluids to order.

| PLUNGER | , Inches | Capacity per | Capacity at 40 | For Eleva- | PIPE SIZ | E, INCHES | Size, Tight and Loose |
|----------|----------|-----------------------------------|-----------------------------------|-------------------|-----------------|-----------|--------------------------|
| Diameter | Stroke | Rev. of Crank Shaft Gallons | to 60 Rev. per Minute, Gallons | tions to, Feet | Suction | Discharge | Pulleys, Inches |
| 5 | | 2. | 80 to 120 | 200 | 31/2 | 3 | 24 x 4 |
| 51/2 | 8 | 2.46 | 98 " 147 | 150 | $31\frac{1}{2}$ | 3 | 24 x 4 |
| 6 | 8 | 2.93 | 117" 175 | 125 | 4 | 31/2 | 24 x 4 |
| 61/2 | 10 | 4.3 | 170 " 260 | 20 0 | 5 | 4 | 30 x 6 |
| 714 | 10 | 5,35 | 214 " 321 | 175 | 6 | 5 | 30 x 6 |
| 8 | 10 | 6.5 | 260 " 390 | 125 | 6 | 5 | 30 x 6 |

Prices on application. Gear ratio 5 to 1

RUMSEY TRIPLEX PUMPS DOUBLE-GEARED

FOR ELEVATIONS OF 230 TO 425 FEET OR 100 TO 185 POUNDS PRESSURE



These pumps have single-acting plungers, outside packed and outside guided. They are used for village waterworks, factory water supply, hydraulic elevators, oil refineries, boiler-feeding, etc. The design and construction have several noteworthy points of merit, insuring great rigidity of frame and accurate alignment. The main bearings are babbitted. The connecting rod boxes and cross head shoes are phosphor bronze and adjustable, the gearing machine cut from solid, all conductive to durability and high efficiency. The valves, packings and working parts are easily accessible. Valve seats and guides are bronze. These pumps are regularly furnished with rubber disc valves for cold water, but will be fitted with bronze when specified. Bronze plungers, bronze fitted cylinders and glands for other liquids furnished to order at extra price, thus adapting them to a variety of service,

| PLUNGER | s, Inches | Capacity , | Capacity at 40 | Working | PIPE SIZ | E, INCHES | Clas Dellass | |
|----------|-----------|--------------------------------------|-----------------------------------|--------------------|----------|-----------|------------------------|--|
| Diameter | Stroke | per Rev. of CrankShaft Gallons | to 50 Rev. per Minute, Gallons | Pressure Pounds | Suction | Discharge | Size Pulleys Inches | |
| 81/4 | 10 | 7.0 | 280 to 350 | 150 | 6 | 5 | 42 x 6 | |
| 9 | 10 | 8.2 | 330 " 413 | 125 | 7 | 6 | 44 x 6 | |
| 9 | 12 | 9.9 | 396 " 495 | 185 | 8 | 8 | *48 x 10 | |
| 10 | 10 | 10.2 | 408 " 510 | 100 | 8 | 8 | 44 x 6 | |
| 10 | 10 | 10.2 | 408 " 510 | 150 | 8 | 8 | *42 x 10 | |
| 10 | 12 | 12.2 | 490 " 612 | 150 | 8 | 8 | *48 x 10 | |

Size marked () are single pulleys; all others are tight and loose. Gear ratio 5 to 1. Prices on application.

RUMSEY POWER ROTARY FORCE PUMPS

No. 198

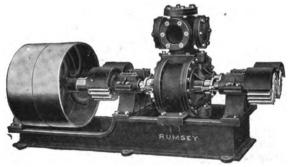


Fig. 9070A

These pumps have heavy steel shafts, with two pairs of heavy gears to relieve the cams, running in boxes lined with babbitt metal scraped to a true bearing; the whole mounted on a heavy and rigid base with suitable lugs for fastening to foundation or floor.

The ends of the teeth in cams that come in contact with the case are packed by bronze blocks inserted into grooves and pressed out by springs, thus insuring perfect vacuum and the taking up of wear.

They discharge a large and constant stream without the aid of an air chamber, can be run at a very high speed without injury, and will operate for months at a time without cessation, having no packing or valves to become obstructed or worn out. There is nothing about these pumps but metal.

Their qualities adapt them for all establishments where an extra quantity of water is required, for manufacturing, fire protection, water works, supplying sprinkler systems in mills, distilleries and breweries, for pumping hot liquors; in sugar and oil refineries, pipe lines, paper mills and starch factories, at railway stations, mines, salt wells; also as wrecking pumps, as they will not become clogged with wet grain, etc.

A capacious vacuum chamber, into which the suction pipe screws, is cast in the frame.

After using turn the cams backward two or three times to empty the pump of water and prevent freezing; then pour in some good oil and turn the cams forward two or three times.

| Number | Speed per Minute Revolutions | Capacity per Minute Gallons | Diameter Suction and Discharge Inches | *Size of Pulleys Inches |
|----------|------------------------------------|-----------------------------------|---|-------------------------------|
| 1 | 100 to 250 | 29 to 72 | 2 | 14 x 4½ |
| 2 | 100 " 250 | 43 " 108 | 21/2 | $16 \times 5\frac{1}{2}$ |
| 3 | 100 " 250 | 87 " 218 | 3 | $18 \times 6^{1/2}$ |
| 4 | 100 " 200 | 168 " 335 | 4 | $20 \times 81\sqrt{2}$ |
| 5 | 100 " 200 | 270 " 540 | 6 | 24 x 8 |
| 6 | 75 " 150 | 342 " 685 | 8 | 28 x 9 |

Furnished in iron, bronze case and cams, or all parts bronze which come in contact with the liquid.

Prices on application.

*For heavy pressure, single pulleys with broad face or pump with short bed plate, out-board bearing and pulleys of larger diameter are furnished at same price.

RUMSEY POWER ROTARY FIRE PUMPS

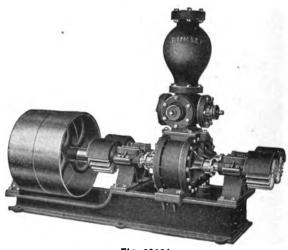


Fig. 8346A

These pumps are arranged so that one, two or three lines of hose can be attached at the same time, or all the stories of a building can be instantly flooded by means of a pipe from the pump and "cut-offs" for hose on each floor, or the pump can be connected directly with the automatic sprinkler system, or the water may be led through underground pipes to hydrants located outside the building.

They may be operated by belting or gearing. A pump purchased exclusively for fire service should be connected by means of gearing as less liable to accident in case of fire. While all sizes of our fire pumps are in extensive use, our Nos. 4, 5 and 6 have met with great favor, and we herewith append directions for their proper management.

No. 4, under all circumstances we recommend the provision of twenty horse-power to throw a single stream, and forty horse-power to run the pump to its full capacity. The rate of speed should be, for one 1-inch stream 100 feet high, 160 revolutions per minute; for two 1-inch streams 100 feet high, 325 revolutions per minute.

for two 1-inch streams 100 feet high, 325 revolutions per minute.

No. 5 requires twenty horse-power to throw one 1-inch stream 100 feet high run at the rate of 85 revolutions per minute, and forty horse-power to throw two 1-inch streams 100 feet high, with a speed of 170 revolutions per minute. To work the pump to its full capacity, viz., three 1½-inch streams thrown to 100 feet high run at the rate of 300 revolutions per minute, will require seventy-five horse-power.

No. 6 requires fifty horse-power to throw two 1/8-inch streams 100 feet high run at 120 revolutions per minute; or ninety horse-power to run the pump to a speed of 220 revolutions per minute (1,000 gallons) against sufficient pressure to throw four 1/6-inch streams to a height of 100 feet.

| | For Good | FIRE DUTY | | Size of Dis- | | T |
|---------|------------------------------------|-----------------------------------|---------------------------------|-----------------------|----------------------|---------------------------|
| Number | Speed per Minute Revolutions | Capacity per Minute Gallons | Size of Suction Pipe, Inches | charge Hose Inches | Number of Streams | Size of Pulleys Inches |
| 1 | 350 | 100 | 2 | 2 | 1 | 14 x 414 |
| ${f 2}$ | 350 | 150 | 214 | 2 | 1 | 16 x 512 |
| 3 | 350 | 300 | 3 | 21/2 | 2 | 18 x 632 |
| 4 | 300 | 500 | 5 | 21.3 | 2 | 20 x 832 |
| 5 | 280 | 750 | 6 | 21.5 | 3 | For Gears |
| 6 | 220 | 1000 | 8 | 213 | 4 | " |

Furnished in iron or bronze case and cams. Prices on application.

RIFE HYDRAULIC RAMS



Fig. 3716A

| Num- | 1 | DIMENS:ONS | | Size of Drive | Size of | Gallons per Min.required | | Weight | Price | Price |
|------|------------|-------------|------------|------------------|----------------------------------|-----------------------------|------------|--------|---------|------------------|
| ber | Height | Length | Width | Pipe Inches | Pipe Inches | to operate Engine | | Pounds | | Double Acting |
| 10 | 2 ft.1 in. | 3 ft. 2 in. | 1 ft. 8in. | 11/4 | 34 | 21 to 6 | - <u>3</u> | 150 | 50.00 | 65.00 |
| 15 | 2 " 1 " | 3 " 4 " | 1 " 8 " | $1\frac{1}{2}$ | 34 | 6 " 12 | 3 | 175 | 55.00 | 70.00 |
| | 2 " 3 " | 3 " 8 " | 1 " 9 " | 2 | 1 | 8 " 18* | 2 | 225 | 60.00 | 75.0 0 |
| 25 | 2 " 3 " | 3 " 9 " | 1 " 9 " | $2\frac{1}{2}$ | 1 | 11 " 24 | 2 | 250 | 66.00 | 81.00 |
| 30 | | 3 " 10 " | 1 " 10 " | 3 | 1 1 $\stackrel{\checkmark}{4}$ | 15 " 35 | 2 | 275 | 75.00 | |
| 40 | 3 " 3 " | 4 " 4 " | 2 " 0 " | 4 | 2 . | 30 " 75 | 2 | 600 | 150.00 | 170.00 |
| 80 | 7 " 4 " | 8 " 4 " | | 8 | 4 | 150 " 350 | 2 | 2200 | 525.00 | 575 00 |
| *120 | 8 " 9 " | 8 " 4 " | 2 " 8 " | 12 | õ | 375 " 750 | 2 | 3000 | 750.00 | 850.00 |
| †120 | 8 "9 " | 8 " 4 " | 2"8" | 12 (2) | 6 | 750 " 1400 | 2 | 6000 | 1500.00 | 1700.00 |

^{*} Single

TABLE OF CAPACITIES

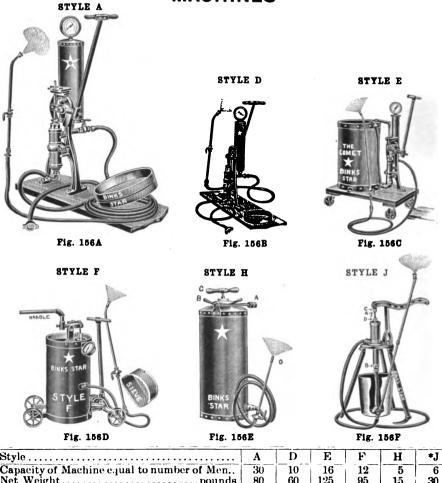
| Power Head | | | | | | | | | Pun | IPIN | 3 H1 | EAD, F | EET | | | | |
|---------------|--------|--------|--------|---------|--------|--------|------|-----|-----|------|------|--------|-----|-----|-----|-----|-----|
| Feet | 4 | 10 | 15 | 20 | 30 | 40 | *50 | 60 | 70 | 80 | 90 | 100 | 120 | 140 | 160 | 180 | 200 |
| 2 | 540 | 192 | 128 | 96 | 64 | 43 | 29 | 24 | | | | | | | | | |
| 3 | | 301 | 192 | 144 | 96 | 72 | 58 | 43 | | 27 | 24 | | | | | | |
| 4 | | 432 | 256 | 192 | 128 | 96 | 77 | 64 | 55 | 43 | 38 | 29 | 24 | | | | |
| 5 | | 540 | 345 | 240 | 160 | 120 | 96 | 80 | 69 | 60 | 53 | 43 | 30 | 26 | | | |
| 6 | | | 432 | 302 | 192 | 144 | 115 | 96 | 82 | 72 | 64 | 57 | 43 | 31 | 27 | 21 | |
| 7 | | | 505 | 378 | 235 | 168 | 134 | 112 | 96 | | 75 | 67 | 50 | 36 | 31 | 28 | 25 |
| 8 | | | | | 270 | | 154 | 128 | 110 | 96 | 86 | 77 | 64 | 55 | 43 | 38 | 29 |
| 9 | | | | 485 | 300 | 216 | 173 | 144 | 124 | 108 | 96 | 86 | 72 | 62 | 54 | 43 | 39 |
| *10 | | | | 540 | 360 | 252 | *192 | 160 | 137 | 120 | 107 | 96 | 80 | 68 | 60 | 53 | 43 |
| 12 | | | | | 430 | | | | | 144 | 128 | 115 | 96 | 82 | 72 | 64 | 57 |
| 14 | | | | | 505 | 353 | 270 | 224 | 192 | 168 | 150 | 135 | 112 | 96 | 84 | 75 | 67 |
| 16 | | | | | | | 323 | 257 | 220 | 192 | 171 | 154 | 128 | 110 | 96 | 85 | 77 |
| 18 | | | | | | | 390 | | | | | 173 | 144 | 124 | 108 | 96 | 86 |
| 20 | | | | | | | 430 | 336 | 288 | 240 | 214 | 192 | 160 | 137 | 120 | 107 | 96 |
| 22 | - | | EXAM | | | | 475 | | | | | 212 | 176 | 151 | 132 | 118 | 105 |
| 24 | Wi | th a | | | 1400 | gral- | 520 | 405 | 346 | 288 | 256 | 230 | 192 | 164 | 144 | 128 | 115 |
| 26 | lons | per m | inute, | 10 f | est fa | 11, 50 | | | | | | 250 | 208 | 178 | 156 | 139 | 125 |
| 99 | feet e | levati | on, No | . 120 I | Engine | will | | | | | | 269 | 224 | 192 | 168 | 149 | 134 |
| 30 | delive | | x 192 | | | | | | | | | 288 | 240 | 206 | 180 | 160 | 144 |

*Multiply factor opposite "Power Head" and under "Pumping Head" by the number of gallons per minute used by the engine and the result will be the number of gallons delivered per day.



[†] Duplex

STAR SPRAYING AND WHITEWASHING MACHINES



Capacity of Machine equal to number of Men.. Net Weight.....pounds 60 125 80 95 15 30 Price.....each | 44.00 | 25.00 | 40.00 | 32.00 | 9.60 | 12.60

As insecticide sprayers for farms, fruit growers, gardeners, florists, etc., machines shown in this catalogue are unequaled. They are high pressure, and have working parts constructed entirely of brass, which is a necessity in an insecticide sprayer. We have thousands of these machines in use among fruit growers for this purpose, but to those who are specially interested in fruit spraying machines, we issue a special catalogue "F" on this subject, showing other types of machines and a treatise on fruit tree spraying. We will be pleased to send same to any one interested for the asking.

The various classes of work to which these machines can be applied are almost

The various classes of work to which these machines can be applied are almost unlimited and it will prove astonishing the amount of work which can be performed in a day by ordinary unskilled labor, while the expense of brushes, pails, ladders, and other tools of the painters' kit are entirely dispensed with.

^{*}Florists' special. Furnished without pail.

KEWANEE WATER SUPPLY SYSTEM

SYSTEM No. 11



Fig. 1087A

These illustrations show three complete Kewanee water works plants. Wherever a private water supply plant is desired for any requirements a Kewanee system can be depended upon for perfect water supply service—for all the conveniences of a good city water works system.

These water systems are furnished in a great many combinations, suited for any requirements. Hand pumps, windmill pumps, hot air pumps, electric driven pumps, steam pumps and gasoline engine driven pumps, are all used in Kewanee systems. The choice depends upon the requirements and preference of the purchaser.

In the Kewanee system, the tank is located in the cellar, or it may be buried in the ground. The water is delivered by air pressure. elevated or attic tank to leak, freeze or overflow or collapse.

Kewanee pumping machinery is built for the special requirements of air pressure service. The pumping machinery is important. Kewanee machinery is the result of over ten years practical and continual experiments. Kewanee pumping machinery is in a class by

The purchaser of a Kewanee system puts all the responsibility up to one firm. These plants are manufactured in one place, are shipped from one place and are guaranteed by the manufacturers.

SYSTEM No. 240

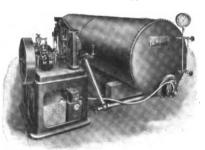


Fig. 1087B

SYSTEM No. 250



Fig. 1087C

There are over 10,000 Kewanee systems in successful operation, which means that these plants are well beyond the experimental stage.

No. 11 System complete as shown with Hand Pump good for 20-foot suction lift, Automatic Tank 30 inches by 8 feet with Supports, Gauges, Valves and Connections, price 150.00.

No. 240 System complete as shown with

No. 240 System complete as shown with 2½ H. P. Gasoline Engine Deep Well Pumping Outfit, 720 gallon Plain Tank 42 inches by 10 feet with Supports, Gauges, Valves and Connections, price 527.00.

No. 250 System complete as shown with 2½ H. P. Gasoline Engine Pumping Outfit,

maximum suction lift 20 feet, 720-gallon Automatic Tank, 42 inches by 10 feet with Supports, Gauges, Valves and Connections.

Price 551.00.

KEWANEE PNEUMATIC TANKS

| Diameter Inches | Length Feet | Thickness Shell Inches | Thickness Head Inches | Weight Pounds | Capacity Gallons | Price Plain Tank | Price Automatic Tank |
|--------------------|----------------|------------------------------|-----------------------------|------------------|---------------------|------------------------|----------------------------|
| 24 | 6 | 15-100 | 5-16 | 370 | 140 | 40.00 | 54.00 |
| 24 | 8 | 15-100 | 5-16 | 445 | 190 | 50.00 | 64.00 |
| 24 | 10 | 15-100 | 5-16 | 525 | 235 | 56.00 | 70.00 |
| 30 | 6 | 18-100 | 5-16 | 558 | 220 | 52.00 | 68.00 |
| 30 | 8 | 18-100 | 5-16 | 677 | 295 | 64.00 | 80.00 |
| 30 | 10 | 18-100 | 5-16 | 795 | 365 | 73.00 | 89.00 |
| 30 | 12 | 18-100 | 5-16 | 914 | 440 | 82.00 | 98.00 |
| 36 | 6 | 3-16 | 5-16 | 760 | 315 | 66.00 | 82.00 |
| 36 | 8 | 3-16 | 5-16 | 926 | 420 | 78.00 | 94.00 |
| 36 | 10 | 3-16 | 5-16 | 1090 | 525 | 92.00 | 108.00 |
| 36 | 12 | 3-16 | 5-16 | 1253 | 630 | 95.00 | 111.00 |
| 36 | 14 | 3-16 | 5-16 | 1420 | 735 | 104.00 | 120.00 |
| 42 | 8 | 1-4 | 5-16 & 3-8 | 1422 | 575 | 95.00 | 112.00 |
| 42 | 10 | 1-4 | 5-16 & 3-8 | 1685 | 720 | 113.00 | 130.00 |
| 42 | 12 | 1-4 | 5-16 & 3-8 | 1953 | 865 | 140.00 | 157.00 |
| 42 | 14 | 1-4 | 5-16 & 38 | 2215 | 1000 | 155.00 | 172.00 |
| 42 | 16 | 1-4 | 5-16 & 38 | 2484 | 1150 | 168.00 | 185.00 |
| 48 | 12 | 1-4 | 3-8 & 7-16 | 2366 | 1130 | 178.00 | 198.00 |
| 48 | 14 | 1-4 | 3-8 & 7-16 | 2665 | 1300 | 195.00 | 215.00 |
| 48 | 16 | 1-4 | 3-8 & 7-16 | 2963 | 1500 | 217.00 | 237.00 |
| 48 | 18 | 1-4 | 3-8 & 7-16 | 3264 | 1700 | 250.00 | 270.00 |
| 48 | 20 | 1-4 | 3-8 & 7 16 | 3565 | 1880 | 280.00 | 300.00 |
| 48 | 24 | 1-4 | 3-8 & 7-16 | 4167 | 2260 | 311.00 | 331.00 |

The above list prices are subject to discount. Kewanee Tanks are made in sizes up to 9 feet in diameter and 40 feet long. Prices of larger tanks than those listed above will be quoted on application. In the automatic Kewanee Tank, any absorption of air by the water is automatically replaced—a full air cushion is maintained without extra attention.

Kewanee Tanks are made of open-hearth boiler steel. This steel has a tensile strength of 60,000 pounds per square inch. On standard tanks, the horizontal seams are double riveted, lap joints; and the girth seams are single riveted. The rivets are accurately spaced on these joints, to hold them in the strongest and stiffest possible way. These points, among others, will appeal to the practical man as essential in the construction of absolutely air-tight tanks.

PNEUMATIC WATER SUPPLY SYSTEM



TANK TRIMMINGS, ETC.

The necessary trimmings for the proper installation of the pressure tank are water gauge, pressure gauge, relief valve and check valve.

Horizontal tanks are tapped for ½-inch water gauge connections in concave head.

The Pressure Gauge connection should not be made into the shell of the tank, but into the service connection from it by means of a "tee."

The Relief Valve should be placed on discharge pipe on a system where a windmill or gasoline engine is used for pumping, and should be set to relieve at 70 pounds.

Fig. 6960A RELIEF VALVE The Check Valve is placed between pump and tank. A gate or globe valve should also be placed between the check valve and tank, so that tank can be shut off if it becomes necessary to repair check valve, or for any other reason.

Brass Check Valves may be furnished if desired at special price.





Fig. 6960B CHECK VALVE



Pig. 6960D

DOUBLE

CYLIN-

DER

AIR

PUMP



Fig. 6960C
"NEW LIGHTNING"
AIR PUMP

Price, Water Gauge Complete, with 3.25 5%-inch Glass and Guards....each Pressure Gauge 8 00 " 3/4-inch Pressure Relief Valve... 2.00 .. 1.25 1-inch Swing Check Valve..... 114-inch " 1.50 11/2 2.00 While it is not absolutely necessary to supply these Tanks with an additional amount of air pressure by means of an air pump, it is advisable to do

The "New Lightning" Pump has 3¼-inch cylinder, 5½-inch stroke, and discharge for 36-inch hose.

so, as better results will be obtained.

The Double Cylinder Pump has 3-inch brass body cylinders and steel ball valves with brass seats.



Fig. 6960F

| Price | "New I | ightning | | | each | 10.00 |
|-------|--------|----------|---------|----------|------|-------|
| 44 | Double | Cylinder | , Brass | Cyl | | 15.00 |
| ** | ** | "" | N. P. | " | | 17.00 |



SECTIONAL 4-COLUMN ROUND STEEL TOWERS

64-FOOT STEEL TOWER AND 30,000 GALLON CYPRESS TANK

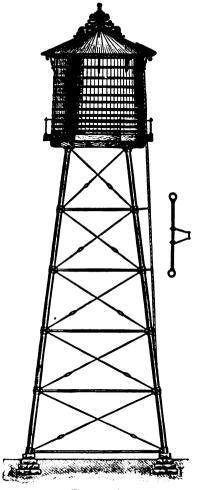


Fig. 6123A

This illustration shows our 4-column Patent Steel Tower, which we build in sections, suitable to support Tanks of dimensions up to and including 20 feet in diameter and of 40,000 gallons capacity.

This style of tower is used extensively in connection with Automatic Sprinkler Plants, for protection against fire in mills, factories, and other large buildings, as whenever a large storage of water is kept on hand, elevated and ready for use, it greatly reduces the fire risk and consequently lessens the cost of insurance. They are also largely used by gardeners and florists for irrigation, and also for water supplies for small villages and private grounds.

CYPRESS WOOD TANKS

| | | | === | | | | | | | |
|-----|------|----------------------|------------|-------------|---------------|-------------------|----------------|------------------|----------------------|-----------------------------|
| | IDE | INS | IDE PTH | Number | Capacity | Weight 1½ inch | Price Each | Weight 2 inch | Price Each 2 inch | Net Ex. for Flat Gal. or |
| | ETER | | | of Hoops | in Gallons | with Lug | with Lug | with Lug | with Lug | Blk. Round |
| Ft. | ln. | Ft. | In. | · | | Ноорв | Hoops | Hoops | Hoops | Hoops |
| 3 | 0 | 2 | 5 | 3 | 120 | 159 | 9.75 | 222 | 12.40 | .20 |
| 3 | 0 | 3 | 0 | 3 | 149 | 178 | 10.80 | 248 | 13.70 | .20 |
| 3 | 0 | 3 | 5 | 4 | 170 | 202 | 12.65 | 281 | 16.00 | .25 |
| 3 | 0 | 4 | 5 | 4 | 220 | 238 | 14.85 | 336 | 18.90 | .25 |
| 3 | 0 | 5 | 5 | 5 | 270 | 286 | 18.00 | 400 | 22.75 | .35 |
| 3 | 6 | 2 | 5 | 3 | 165 | 187 | 11.30 | 263 | 14.45 | .20 |
| 3 | 6 | 3 | 0 | 3 | 205 | 209 | 12.50 | 292 | 15.90 | .20 |
| 3 | 6 | 3 | 5 | 4 | 234 | 240 | 14.75 | 322 | 18.40 | .30 |
| 3 | 6 | 4 | 5 | 4 | 303 | 280 | 17.10 | 392 | 21.80 | .30 |
| 3 | 6 | 5 | 5 | 5 | 371 | 333 | 20.55 | 466 | 26.20 | .35 |
| 4 | 0 | 2 | 5 | 3 | 217 | 222 | 13.40 | 308 | 16.75 | .25 |
| 4 | 0 | 3 | 0 | 3 | 270 | 246 | 14.70 | 342 | 18.40 | .25 |
| 4 | 0 | 3 | 5 | 4 | 307 | 279 | 17.10 | 387 | 21.40 | .35 |
| 4 | Ô | 4 | 5 | 4 | 398 | 326 | 19.90 | 457 | 25.35 | .35 |
| 4 | Ŏ | 5. | 5 | 5 | 488 | 389 | 23.85 | 541 | 30.30 | .45 |
| 4 | 6 | 2 | 5 | 3 | 276 | 254 | 15.10 | 353 | 19.00 | .30 |
| 4 | 6 | 3 | ŏ | 3 | 342 | 280 | 16.40 | 392 | 20.90 | .30 |
| 4 | 6 | 3 | ă | 4 | 381 | 319 | 19.40 | 443 | 24.30 | .40 |
| 4 | 6 | 4 | 5 | 4 | 496 | 372 | 22.40 | 518 | 28.55 | .40 |
| 4 | 6 | $\hat{5}$ | 5 | 5 | 600 | 439 | 26.70 | 611 | 33.90 | .50 |
| 5 | 0 | $\mathbf{\tilde{2}}$ | 5 | 3 | 343 | 288 | 16.85 | 402 | 21.50 | .35 |
| 5 | ŏ | 3 | ő | 3 | 426 | 318 | 18.50 | 453 | 23.55 | .35 |
| 5 | ő | 3 | 5 | 4 | 485 | 368 | 22.30 | 508 | 28.05 | .50 |
| 5 | ő | 4 | 5 | 4 | 627 | 425 | 25.80 | 593 | 32.90 | .50 |
| 5 | ő | 5 | 5 | 5 | 769 | 501 | 30.60 | 693 | 38.60 | .60 |
| 5 | ő | 6 | 5 | 5 | 911 | 559 | 33.80 | 778 | 42.70 | .60 |
| 5 | 0 | 7 | 5 | 6 | 1053 | 637 | 38.85 | 884 | 48.90 | .75 |
| 5 | 6 | 2 | 5 | 3 | 416 | 324 | 18.80 | 452 | 24.00 | .35 |
| 5 | 6 | 3 | ő | 3 | 516 | 356 | 20.50 | 498 | 26.30 | .35 |
| 5 | 6 | 3 | 5 | 4 | 588 | 408 | 24.50 | 564 | 30.90 | .55 |
| 5 | 6 | 4 | 5 | 4 | 761 | 473 | 28.40 | 660 | 36.30 | .55 |
| 5 | 6 | 5 | 5 | 5 | 933 | 554 | 33.30 | 770 | 42.30 | .65 |
| 5 | 6 | 6 6 | 5 | 5 | 1006 | 619 | 36.90 | 861 | 46.90 | .65 |
| | | | 5 | 6 | 1178 | 704 | 42.35 | 977 | 53.70 | .85 |
| 5 | 6 | 7 | | | | | | | | |
| 6 | 0 | 3 | 5 | 4 | 702 908 | 457 | 27.30 31.55 | 629 730 | 34.35 | .60 .60 |
| 6 | 0 | 4 | 5 5 | 4 5 | | 526 | | | 39.80 | |
| 6 | 0 | 5 | | | 1114 | 612 | 36.75 42.70 | 848 975 | 46.30 | .75 |
| 6 | 0 | 6 | 5 | 6 | 1319 | 704 | | | 53.60 | .90 |
| 6 | 0 | 7 | 5 | 6 | 1525 | 774 | 46.20 | 1076 | 58.80 | .90 |
| 6 | 0 | 8 | 5 | 7 | 1730 | 872 | 54.00 | 1205 | 68.50 | 1.10 |
| 6 | 0 | 9 | 5 | 7 | 1936 | 941 | 58.00 | 1307 | 73.80 | 1.10 |
| 6 | 6 | 3 | 5 | 4 | 826 | 500 | 29.70 | 691 | 37.55 | .65 |
| 6 | 6 | 4 | 5 | 4 | 1068 | 577 | 34.40 | 803 | 43.50 | .65 |
| 6 | 6 | 5 | 5 | 5 | 1310 | 667 | 39.80 | 928 | 50.40 | .80 |
| 6 | 6 | 6 | 5 | 6 | 1552 | 769 | 46.00 | 1062 | 58.15 | 1.00 |
| 6 | 6 | 7 | 5 | 6 | 1794 | 843 | 50.00 | 1171 | 64.20 | 1.00 |
| 6 | 6 | 8 | 5 | 7 | 2036 | 950 | 58.50 | 1313 | 74.30 | 1.20 |
| 6 | 6 | 9 | 5 | 7 | 2278 | 1025 | 62.80 | 1422 | 80.00 | 1.20 |
| 7 | 0 | 3 | 5 | 4 | 960 | 556 | 33.10 | 766 | 41.50 | . 75 |
| _7 | 0 | 4 | 5 | 4 | 1241 | 638 | 38.65 | 883 | 48.10 | .75 |

CYPRESS WOOD TANKS

| | | | | , | | 100 1 1 | B . 10 . 17 | 111.1.1.1 | in to the t | 127-4 () (|
|-------------|-----|----------------|---------------|--------|----------------------|----------------------|-----------------------|-------------------|----------------------|-----------------------------|
| Ins Diam | IDE | | IDE PTH | Number | Capacity | Weight | Price Each 14 inch | Weight 2 inch | Price Each 2 inch | Net Ex. for Flat Gal. or |
| Ft. | In. | Ft. | In. | Hoops | in Gallons | with Lug Hoops | with Lug | with Lug Hoops | with Lug Hoops | Blk. Round Hoops |
| 7 | 0 | 5 | $\frac{1}{5}$ | 5 | 1522 | 734 | 43.60 | 1020 | 55.50 | .90 |
| 7 | ő | 6 | 5 | 6 | 1803 | 848 | 50.80 | 1169 | 64.20 | 1.15 |
| 7 | ő | 7 | 5 | 6 | 2084 | 929 | 55.30 | 1286 | 70.15 | 1.15 |
| 7 | ŏ | 8 | 5 | 7 | 2365 | 1029 | 63.00 | 1424 | 80.10 | 1.30 |
| 7 | 0 | 9 | 5 | 8 | 2646 | 1134 | 69.80 | 1567 | 87.80 | 1.50 |
| 7 | 6 | 3 | 5 | 4 | | 604 | 37.50 | 834 | 44.90 | .80 |
| ŕ | 6 | 4 | 5 | | $\frac{1104}{1427}$ | 688 | 41.00 | 959 959 | 51.90 | .80 |
| 7 | 6 | 5 | 5 | 4 5 | 1750 | 772 | 45.75 | 1105 | 59.90 | .95 |
| 7 | 6 | 6 | 5 | 6 | 2073 | 916 | 54.60 | 1263 | 69.00 | 1.25 |
| ż | 6 | 7 | 5 | 7 | 2396 | 1021 | 60.30 | 1409 | 76.50 | 1.40 |
| 7 | 6 | ់ទ | 5 | 7 | 2590 2719 | 1107 | 67.60 | 1534 | 85.35 | 1.40 |
| 7 | 6 | 9 | 5 | 8 | 3042 | 1221 | 74.80 | - 1688 | 94.30 | 1.60 |
| 8 | ő | 3 | 5 | 4 | 1258 | 653 | 38.40 | 901 | 48.30 | 85 |
| 8 | 0 | 4 | 5 | 4 | 1626 | 753 | 44.40 | 1043 | 54.00 | .90 |
| 8 | ŏ | 5 | 5 | 5 | 1994 | 873 | 51.90 | 1208 | 65.80 | 1.15 |
| 8 | 0 | 6 | 5 | 6 | 2362 | 995 | 59.10 | 1368 | 74.90 | 1.40 |
| 8 | ő | 7 | 5 | 7 | 2302 2730 | 1109 | 66.20 | 1526 | 82.90 | 1.55 |
| 8 | 0 | 8 | 5 | 7 | 3098 | 1248 | 76.10 | 1707 | 95.20 | 2.00 |
| | 0 | 9 | 5 | | | 1368 | 83.55 | 1871 | 104.70 | 2.25 |
| 8 | | | 5 | 8 | 3466 | 1587 | 96.20 | 2173 | 121.20 | 2.55 |
| 8 8 | 0 | 11 3 | 5 | 9 | $\frac{4203}{1422}$ | | 43.70 | 974 | 54.70 | .90 |
| | 6 | | 5 | 4 | | 703 809 | 47.50 | 1124 | 60.60 | .95 |
| 8 8 | 6 | 5 | 5 | 4 5 | $\frac{1838}{2254}$ | 937 | 55.40 | 1297 | 70.40 | 1.20 |
| | 6 | 6 | | 6 | 2254 2670 | 1065 | 63.25 | 1467 | 80.00 | 1.45 |
| 8 8 | 6 | 7 | 5 5 | 7 | | 1188 | 70.60 | 1634 | 87.80 | 1.65 |
| | 6 | 8 | 5 | 7 | 3086 3503 | 1334 | 78.80 | 1825 | 101.50 | 2.15 |
| 8 8 | 6 | 9 | 5 | 8 | 3919 | 1462 | 88.90 | 1997 | 111.20 | 2.10 |
| 8 | 6 | 11 | 5 | | 5919 4751 | 1703 | 102.80 | 2330 | 129.60 | $\frac{2.30}{2.80}$ |
| 9 | 0 | 3 | 5 | 9 | | 756 | 43.80 | 1047 | 55.60 | 1 .95 |
| 9 | _ | 4 | 5 | 4 | 1595 206 3 | 873 | 51.30 | 1211 | 65.40 | 1.05 |
| 9 | 0 | | 5 | 4 | 2003 2530 | 1004 | 59.10 | 1487 | 77.50 | 1.30 |
| - | 0 | 5 6 | 5 | 5 6 | 2997 | 1174 | 69.20 | 1604 | 86.40 | 1.90 |
| 9 9 | 0 | 7 | 5 | 7 | 2991 3464 | 1316 | 80.10 | 1795 | 97.00 | 2.25 |
| 9 | 0 | 8 | 5 | 7 | 3931 | 1413 | 85.60 | 1943 | 107.70 | 2.25 |
| 9 | | 9 | 5 | | 4398 | 1555 | 93.50 | 2128 | 118.00 | 2.50 |
| 9 | 0 | | 5 | 8 9 | 5332 | 1813 | 109.00 | 2479 | 137.20 | 2.95 |
| 9 | 6 | $\frac{11}{3}$ | 5 | 4 | 1780 | 812 | 49.30 | 1122 | 59.40 | 1.00 |
| 9 | 6 | | 5 | 4 | | 935 | 54.70 | 1295 | 69.70 | 1.15 |
| 9 | | 4 | 5 | | $\frac{2300}{2821}$ | 1071 | 62.80 | 1482 | 79.30 | 1.35 |
| 9 | 6 | 5 6 | 5 | 5 | | 1249 | 73.35 | 1711 | 91.85 | 2.00 |
| 9 | 6 | 7 | 5 | 7 | 3344 386 3 | 1400 | 82.50 | 1911 | 103.00 | 2.35 |
| | | | 5 | | | 1506 | 90.40 | 2069 | 114.40 | 2.35 |
| 9 | 6 | 8 | 5 | 7 | 4384 | 1653 | 99.10 | 2262 | 125.10 | 2.65 |
| 9 | 6 | 9 | 5 | 8 9 | 4905 5947 | 1922 | | 2630 | 145.50 | 3.10 |
| 9 | 6 | $\frac{11}{5}$ | 5 | 5 | 3129 | 1170 | 115.25 68.20 | 2650 1610 | 85.80 | 1.75 |
| 10 | 0 | | 5 | 6 | | 1327 | 77.70 | 1818 | 97.35 | 2.10 |
| 10 | 0 | 6 | 5 | 7 | $\frac{3707}{4285}$ | | 89.10 | 2028 | 109.00 | 2.50 |
| 10 | 0 | | | | | 1485 1601 | 95.70 | 2028 2197 | 109.00 | 2.50 |
| 10 | 0 | 8 | 5 | 7 | $\frac{4862}{5440}$ | 1750 | 104.70 | 2397 | 132.35 | 2.80 |
| 10 | | 1 | | 8 | | | | 2780 | | 3.25 |
| 10 | 0 | 11 | 5 | 9 | 6596 | 2 0 30 | 121.60 | 2100 | 153.65 | 0.20 |

WHEN CAUENING BY CIGOTH COMPANY . -----

CYPRESS WOOD TANKS

| | IDE | | IDE | Number | Capacity | Weight 2 inch | Price Each | Weight 21/2 inch | Price Each 2½ inch | Net Ex. for Flat Gal. or |
|----------|-------|-----|-----|-------------|---------------|-------------------|-------------------|---------------------|-----------------------|-----------------------------|
| Ft. | IETER | Ft. | In. | of Hoops | in Gallons | with Lug Hoops | with Lug Hoops | with Lug Hoops | with Lug Hoops | Blk. Round Hoops |
| 10 | 6 | 5 | 5 | 5 | 3414 | 1709 | 90.85 | 2311 | 114.60 | 1.85 |
| 10 | 6 | 6 | 5 | 6 | 4044 | 1930 | 103.10 | 2600 | 129.50 | 2.25 |
| 10 | 6 | 7 | 5 | 7 | 4674 | 2146 | 115.00 | 2890 | 144.40 | 2.60 |
| 10 | 6 | 8 | 5 | 7 | 5305 | 2323 | 127.85 | 3137 | 156.10 | 2.60 |
| 10 | 6 | 9 | 5 | 8 | 5935 | 2533 | 139.60 | 3419 | 169.00 | 2.95 |
| 10 | 6 | 11 | 5 | 9 | 7195 | 2937 | 162.00 | 3965 | 202.30 | 3.40 |
| 11 | ŏ | 5 | 5 | 5 | 3792 | 1816 | 96.60 | 2455 | 119.30 | 2.00 |
| ii | ŏ | 6 | 5 | 6 | 4492 | 2036 | 108.50 | 2749 | 136.60 | 2.30 |
| 11 | Ö | 7 | 5 | 7 | 5192 | 2268 | 121.25 | 3054 | 152.30 | 2.70 |
| 11 | Ö | 8 | 5 | 7 1 | 5893 | 2450 | 134.55 | 3309 | 163.00 | 2.70 |
| 11 | Ŏ | 9 | 5 | 8 | 6596 | 2692 | 148.30 | 3624 | 179.25 | 3.20 |
| 11 | 0 | 11 | 5 | 9 | 7993 | 3112 | 170.25 | 4198 | 214.10 | 3.70 |
| 11 | Ü | 13 | 5 | 10 | 9393 | 3546 | 188.40 | 4778 | 244.00 | 4.30 |
| 11 | 6 | 5 | 5 | 5 | 4148 | 1923 | 102.10 | 2599 | 129.00 | 2.10 |
| 11 | 6 | 6 | 5 | 6 | 4913 | 2153 | 114.50 | 2904 | 144.10 | 2.45 |
| 11 | 6 | 7 | 5 | 7 | 5679 | 2392 | 127.60 | 3220 | 159.15 | 2.85 |
| 11 | 6 | 8 | 5 | 7 | 6445 | 2585 | 141.70 | 3480 | 171.80 | 2.85 |
| 11 | 6 | 9 | 5 | 8 | 7211 | 2834 | 156.00 | 3816 | 188.75 | 3.40 |
| 11 | 6 | 11 | 5 | 9 | 8742 | 3278 | 179.00 | 4413 | 225.00 | 3.90 |
| 11 | 6 | 13 | 5 | 10 | 10273 | 3730 | 197.55 | 5024 | 256.25 | 4.50 |
| 12 | 0 | 5 | 5 | 5 | 4519 | 2028 | 107.50 | 274 2 | 129.00 | 2.20 |
| 12 | 0 | 6 | 5 | 6 | 5353 | 2268 | 120.40 | 3063 | 140.10 | 2.55 |
| 12 | 0 | 7 | 5 | 7 | 6187 | 2516 | 134.00 | 3394 | 159.15 | 3.00 |
| 12 | 0 | 8 | 5 | 7 | 7022 | 2719 | 148.80 | 3675 | 171.80 | 3.00 |
| 12 | 0 | 9 | 5 | 8 | 7856 | 2981 | 163.70 | 4018 | 188.75 | 3.55 |
| 12 | 0 | 11 | 5 | 9 | 9525 | 3440 | 187.50 | 4641 | 225.00 | 4.05 |
| 12 | 0 | 13 | 5 | 10 | 11193 | 3912 | 207.00 | 5275 | 256.25 | 4.70 |
| 12 | 6 | 5 | 5 | 5 | 4906 | 2136 | 113.00 | 2890 | 135.60 | 2.25 |
| 12 | 6 | 6 | 5 | 6 | 5812 | 2385 | 126.35 | 3224 | 151.70 | 2.65 |
| 12 | 6 | 7 | 5 | 7 | 6718 | 264 5 | 140.60 | 3566 | 167.30 | 3.10 |
| 12 | 6 | 8 | 5 | 7 | 7623 | 2853 | 155.90 | 3859 | 180.40 | 3.10 |
| 12 | 6 | 9 | 5 | 8 | 8529 | 31 2 6 | 170.10 | 4219 | 198.00 | 3.70 |
| 12 | 6 | 11 | 5 | 9 | 10341 | 3605 | 196.20 | 4869 | 235.70 | 4.25 |
| 12 | 6 | 13 | 5 | 10 | 12151 | 4196 | 216.40 | 5530 | 268.30 | 4.90 |
| 13 | 0 | 7 | 5 | 7 | 6981 | 2798 | 148.90 | 3767 | 185.70 | 3.45 |
| 13 | 0 | 8 | 5 | 7 | 7890 | 3016 | 163.70 | 4069 | 205.10 | 3.45 |
| 13 | 0 | 9 | 5 | 8 | 8798 | 3297 | 179.50 | 4438 | 218.70 | 4.00 |
| 13 | 0 | 11 | 5 | 9 | 10614 | 3812 | 207.85 | 5122 | 260.70 | 4.70 |
| 13 | 0 | 13 | 5 | 10 | 12431 | 4316 | 231.00 | 5804 | 298.15 | 5.40 |
| 14 | 0 | 7 | 5 | 7 | 8439 | 3089 | 163.00 | 4147 | 204.35 | 3.90 |
| 14 | 0 | 8 | 5 | 8 | 9577 | 3369 | 183.40 | 4520 | 222.90 | 4.30 |
| 14 | 0 | .9 | 5 | 9 | 10715 | 3683 | 201.35 | 4928 | 244.00 | 5.05 |
| 14 | 0 | 11 | 5 | 10 | 12990 | 4232 | 231.40 | 5661 | 289.00 | 5.80 |
| 14 | 0 | 13 | 5 | 11 | 15266 | 4780 | 253.70 | 6396 | 326.70 | 6.50 7.55 |
| 14 | 0 | 15 | 5 | 12 | 17552 | 5359 | 284.90 | 7164 | 373.85 | 4.30 |
| 15 | 0 | 7 | 5 | 7 | 9695 | 3425 | 186.00 | 4585 | 231.30 | 5.00 |
| 15 | 0 | 8 | 5 | 8 | 11002 | 3762 | 211.80 | 5020 | 254.90 | 5.80 5.80 |
| 15 15 | 0 | 9 | 5 | 9 | 12310 | 4107 | 232.50 | 5469 | 279.20 | 6.60 |
| 15 15 | 0 | 11 | 5 | 10 | 14924 | 4704 | 266.20 | 6263 | 329.(0 | |
| _ 15 | 0 | 13 | 5 | 12 | 17539 | 5594 | 308.70 | 7352 | 385.45 | 10.15 |

CYPRESS WOOD TANKS

| | IDE IETER | Insii Dept | | Number of | Capacity in | Weight 2 inch | Price Each 2 inch | Weight 2½ inch | 21/2 inch | Net Ex. for Flat Gal. or |
|-----|--------------|---------------|-----|--------------|----------------|-------------------|----------------------|-------------------|-------------------|-----------------------------|
| Ft. | In. | Ft. | In. | Hoops | Gallons | with Lug Hoops | with Lug Hoops | with Lug Hoops | with Lug Hoops | Blk.Round Hoops |
| 15 | 0 | 15 | 5 | 13 | 20154 | 6228 | 344.35 | 8188 | 441.75 | 11.25 |
| 16 | 0 | 7 | 5 | 7 | 11039 | 3726 | 201.60 | 4987 | 250.90 | 4.70 |
| 16 | 0 | 8 | 5 | 8 | 12527 | 4094 | 229.80 | 5462 | 276.70 | 5.55 |
| 16 | 0 | 9 | 5 | 9 | 14016 | 4461 | 254.00 | 5935 | 304.50 | 6.40 |
| 16 | 0 | 11 | 5 | 10 | 16992 | 5255 | 294.30 | 6940 | 359.70 | 8.85 |
| 16 | 0 | 13 | 5 | 12 | 19969 | 6032 | 332.85 | 7929 | 415.60 | 11.05 |
| 16 | 0 | 15 | 5 | 13 | 22946 | 6707 | 368.00 | 8817 | 475.40 | 12.25 |
| 16 | 0 | 17 | 5 | 14 | 25922 | 7382 | 405.55 | 9703 | 510.00 | 13.40 |
| 16 | 0 | 19 | 5 | 15 | 28899 | 8097 | 446.20 | 10630 | 582.80 | 14.90 |
| 18 | 0 | 9 | 4 | 9 | 17602 | 5381 | 297.90 | 7093 | 356.90 | 9.45 |
| 18 | 0 | 11 | 4 | 10 | 21374 | 6135 | 343.30 | 8081 | 419.35 | 10.75 |
| 18 | 0 | 13 | 4 | 12 | 25446 | 7048 | 385.10 | 9229 | 483.70 | 13.40 |
| 18 | 0 | 15 | 4 | 13 | 28918 | 7844 | 429.90 | 10262 | 553.85 | 15.05 |
| 18 | 0 | 17 | 4 | 14 | 32690 | 8681 | 474.90 | 11334 | 594.90 | 16.75 |
| 18 | 0 | 19 | 4 | 15 | 36452 | 9480 | 519.80 | 12367 | 676.80 | 18.40 |
| 20 | 0 | 9 | 4 | 9 | 21751 | 6243 | 349.35 | 8214 | 413.70 | 11.40 |
| 20 | 0 | 11 | 4 | 10 | 26414 | 7079 | 396.50 | 9315 | 482.90 | 12.85 |
| 20 | 0 | 13 | 4 | 12 | 31073 | 8108 | 445.00 | 10611 | 555.80 | 16.15 |
| 20 | 0 | 15 | 4 | 13 | 35734 | 8989 | 494.15 | 11760 | 634.45 | 17.95 |
| 20 | 0 | 17 | 4 | 14 | 40395 | 9872 | 543.30 | 12910 | 681.30 | 19.80 |
| 20 | 0 | 19 | 4 | 15 | 45057 | 10799 | 596.10 | 14105 | 775.60 | 22.00 |
| | | | · | | | | | | | |

3 INCH COMPLETE WITH LUGS

| Insii Diame | | Insid Dept | | Number | Capacity | Weight with Lug Hoops | Price Each with Lug | Net Extra for Fiat Gal. or Black Round |
|----------------|-----|---------------|-----|--------|----------|-----------------------------|-------------------------|--|
| Ft. | In. | Ft. | In. | Hoops | Gallons | Pounds | Hoops | Hoops |
| 16 | 0 | 9 | 5 | 9 | 14016 | 7641 | 356.20 | 6.40 |
| 16 | 0 | 11 | 5 | 10 | 16992 | 8896 | 417.85 | 8.85 |
| 16 | 0 | 13 | 5 | 12 | 19969 | 10135 | 481.20 | 11.05 |
| 16 | 0 | 15 | 5 | 13 | 22946 | 11272 | 550.85 | 12.25 |
| 16 | 0 | 17 | 5 | 14 | 25922 | 12408 | 582.40 | 13.40 |
| 16 | 0 | 19 | 5 | 15 | 28899 | 13585 | 675.15 | 14.90 |
| 18 | 0 | 9 | 4 | 9 | 17602 | 9070 | 413.60 | 9,45 |
| 18 | 0 | 11 | 4 | 10 | 21374 | 10338 | 486.60 | 10.75 |
| 18 | 0 | 13 | 4 | 12 | 25446 | 11764 | 559.00 | 13.40 |
| 18 | 0 | 15 | 4 | 13 | 28918 | 13074 | 640.15 | 15.05 |
| 18 | 0 | 17 | 4 | 14 | 32690 | 14426 | 689 . 2 5 | 16.75 |
| 18 | 0 | 19 | 4 | 15 | 36452 | 15736 | 777.00 | 18.40 |
| 20 | 0 | 9 | 4 | 9 | 21751 | 10466 | 478.50 | 11.40 |
| 20 | 0 | 11 | 4 | 10 | 26414 | 11867 | 562.00 | 12.85 |
| 20 | 0 | 13 | 4 | 12 | 31073 | 13463 | 642.40 | 16.15 |
| 20 | 0 | 15 | 4 | 13 | 35734 | 14912 | 727.70 | 17.95 |
| 20 | 0 | 17 | 4 | 14 | 40395 | 16362 | 778.55 | 19.80 |
| 20 | 0 | 19 | 4 | 15 | 45057 | 17857 | 886.30 | 22.00 |
| 22 | 0 | 9 | 4 | 9 | 26339 | 11967 | 557.80 | 13.00 |
| 22 | 0 | 11 | 4 | 10 | 31983 | 13620 | 649.00 | 14.60 |
| 22 | 0 | 13 | 4 | 12 | 37627 | 15490 | 744.20 | 18.65 |
| 22 | 0 | 15 | 4 | 13 | 43271 | 17099 | 845.65 | 20.70 |
| 22 | 0 | 17 | 4 | 14 | 48915 | 18820 | 906.75 | 23.15 |
| 22 | 0 | 19 | 4 | 15 | 54559 | 20484 | 1033.10 | 25.55 |

CYPRESS WOOD TANKS

3-INCH COMPLETE WITH LUGS

| | IDE ETER | | IDE PTH | Number of | Capacity | Weight with Lug Hoops | Price Each With Lug | Net Extra for Flat Galvanized or Black Round |
|-------------|-------------|-----|------------|--------------|----------|--------------------------|------------------------|--|
| Ft. | In. | _Ft | In. | Hoops | Gallons | Pounds | Hoops | Hoops |
| 24 | 0 | 9 | 4 | 9 | 31366 | 13439 | 624.50 | 14.60 |
| 24 | 0 | 11 | 4 | 10 | 38087 | 15190 | 723.60 | 16.80 |
| 24 | 0 | 13 | 4 | 12 | 44808 | 17218 | 830.45 | 21.20 |
| 24 | 0 | 15 | 4 | 13 | 51529 | 19025 | 945.80 | 23.85 |
| 24 | 0 | 17 | 4 | 14 | 58250 | 20842 | 1010.6 0 | 26.50 |
| 24 | 0 | 19 | 4 | 15 | 64972 | 22639 | 1145.30 | 29.15 |
| 26 | 0 | 9 | 4 | 9 | 36831 | 15052 | 694.45 | 16.75 |
| 26 | 0 | 11 | 4 | 10 | 44723 | 16937 | 823.70 | 19.15 |
| 26 | 0 | 13 | 4 | 12 | 52616 | 19119 | 920.40 | 23.90 |
| 26 | 0 | 15 | 4 | 13 | 60580 | 21066 | 1044.80 | 26.80 |
| 26 | 0 | 17 | 4 | 14 | 68400 | 23082 | 1113.35 | 29.65 |
| 26 | 0 | 19 | 4 | 15 | 76296 | 25030 | 1261.60 | 32.50 |
| 2 8 | 0 | 9 | 4 | 9 | 42735 | 16687 | 76 8.80 | 18.65 |
| 28 | 0 | 11 | 4 | 10 | 51892 | 18698 | 888.40 | 21.20 |
| 2 8 | 0 | 13 | 4 | 12 | 61050 | 21096 | 1015.10 | 26.80 |
| 2 8 | 0 | 15 | 4 | 13 | 70207 | 23181 | 1148.50 | 29.85 |
| 28 | 0 | 17 | 4 | 14 | 76365 | 25256 | 1220.15 | 32.85 |
| 2 8 | 0 | 19 | 4 | 15 | 88523 | 27342 | 1374.50 | 35.90 |
| 30 | 0 | 9 | 4 | 9 | 49078 | 18420 | 847.30 | 20.90 |
| 30 . | 0 | 11 | 4 | 10 | 58584 | 20584 | 976.20 | 23.65 |
| 30 | 0 | 13 | 4 | 12 | 69111 | 23218 | 1115.50 | 30.25 |
| 30 | 0 | 15 | 4 | 13 | 79627 | 25451 | 1258.45 | 33.5 5 |
| 30 | 0 | 17 | 4 | 14 | 90144 | 27684 | 13 34.35 | 36.85 |
| 30 | √ 0 | 19 | 4 | 15 | 100661 | 29913 | 1504.90 | 40.15 |

The above capacities are based on tanks with straight staves; but unless otherwise ordered, we usually make them with a slight taper.

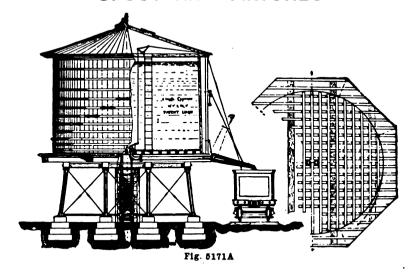
All tanks up to, and including 14 feet diameter, are fitted with one pair of Tecktonius' Patent Lugs to each hoop. Tanks from 15 to 20 feet inclusive are fitted with two Lugs to each hoop. Tanks from 22 to 30 feet inclusive are fitted with three Lugs to each hoop.

FACTORY MUTUAL TANKS

| Ot | TSIDE | DIAMETI | ER | INSTRE | ДЕРТН | | | | |
|-----|-------|---------|-----|--------|--------------|--------------------|----------------|------------------|---------------|
| Вот | TOM | T | OP | INSIDE | DEFIN | Number of Round | Capacity in | Weight Pounds | Price Each |
| Ft. | In. | Ft. | In. | Ft. | In. | Hoops | Gallons | Tourida | |
| 13 | 7 | 13 | 1 | 11 | 4 | 11 | 10000 | 5336 | 310.15 |
| 14 | 10 | 14 | 3 | 13 | 4 | 14 | 15000 | 6819 | 397.50 |
| 15 | 10 | 15 | 2 | 15 | 4 | 16 | 20000 | 8523 | 488.75 |
| 17 | 10 | 17 | 2 | 15 | 4 | 16 | 25000 | 12378 | 674.95 |
| 18 | 4 | 17 | 7 | 17 | 4 | 20 | 30000 | 14514 | 774.45 |
| 22 | 4 | 21 | 6 | 19 | 4 | 23 | 50000 | 20996 | 1166.55 |
| 25 | 0 | 24 | 0 | 23 | 4 | 31 | 75000 | 31852 | 1748.55 |
| 29 | 0 | 28 | 0 | 23 | 4 | 34 | 100000 | 36584 | 2132.40 |

The specifications of the Factory Mutual Insurance Companies require that tanks shall be built of one particular size for a given capacity, and constructed of 2½ inch material for 20,000 gallons and under, and of 3-inch material for 25,000 gallons and over. The hooping must be also of a certain standard. The above prices are for tanks to meet their requirements.

IMPROVED VALVE, OUTLET PIPE, GALVANIZED SPOUT AND FIXTURES



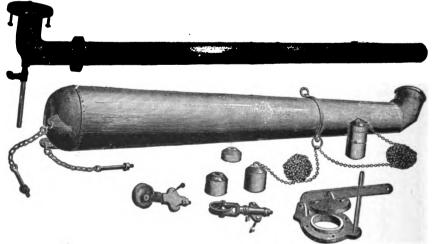
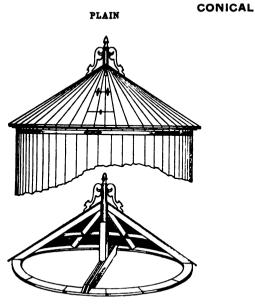


Fig. 5171B

| Diameter of Tank | | Size I | NCHES | |
|---------------------|-------|--------|--------|--------|
| Feet | 6 | 7 | 8 | 10 |
| 16 | 70.00 | 80.00 | 90.00 | 122,00 |
| 20 | 75.00 | 85.00 | 95.00 | 128.00 |
| 24 | 80.00 | 90.00 | 100.00 | 134.00 |

When ordering give diameter and elevation of tank, and distance to center of track.

TANK COVERS, ETC.



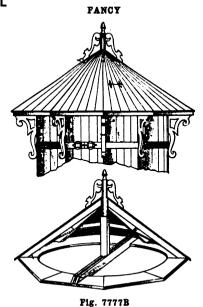


Fig 7777A

PLAIN

| Sizefeet | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 |
|---------------|-------|-------|-------|--------|--------|--------|--------|--------|-------|
| Weightpounds | | 120 | 170 | 221 | 307 | 362 | 451 | 619 | 852 |
| Priceeach | | 7.00 | 9.00 | 11.00 | 14.00 | 18.00 | 22.00 | 30.00 | 40.00 |
| Sizefeet | 16 | 18 | 20 | 22 | 24 | 26 | 28 | . 30 | |
| Weight pounds | 1118 | 1558 | 1916 | 2304 | 3055 | 3862 | 4454 | 4783 | |
| Price each | 55.00 | 70.00 | 85.00 | 105.00 | 135.00 | 170.00 | 200.00 | 230.00 | |

FANCY

| Sizefeet | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 | 14 |
|------------------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|
| Weightpounds Priceeach | 130 6.00 | 175 9.00 | 254 12.00 | 326 16.00 | 458 22.00 | 540 26.00 | 708 33.00 | 958 45.00 | 1356 60.00 |
| Sizefeet | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | |
| Weightpounds Priceeach | 1780 80.00 | 2190 100.00 | 2913 125.00 | 3410 150.00 | 4416 200.00 | 5338 230.00 | 6026 260.00 | 6626 285.00 | |

TECKTONIUS' PATENT HOOP LUGS

| Sizeinches | | | | | | | | 5 | 6 |
|---|------------------|-----------------------|-----------------------|--------------------|---------------------|------------------------|-------------------------------|------------------|-------------------------------------|
| Size of Boltinches Weightpounds Priceeach | ½x13 2 .40 | 1/2x13 23/4 .50 | 5/8×14 31/4 .60 | 5/8×16 5 .80 | 34x18 7¼ 1.00 | 7⁄8×18 91∕2 1.50 | 34×18 $131/2$ 2.00 | 19 19 3.00 | $\frac{\frac{7}{8}x20}{26}$ 3.50 |

ROUND IRON LUGS

| Sizeinches | 1, | 5/8 | 3/4 | 7/8_ | 1 | 11/8 |
|------------|------|-----|-----|------|-----|------|
| Priceeach | . 20 | .25 | .35 | .50 | .75 | 1.00 |

TANK VALVES, ETC.

U. E. OUTLET VALVE



TANK CHECK VALVE







Fig. 339A

Fig. 339B

Fig. 339C

U. S. OUTLET AND FLOAT VALVES

| Sizeinches | | | | | | | 21/2 | | 4 |
|-------------------------|-----|-----|-----|------|------|------|------|------|------|
| Price, Outlet Valveeach | .75 | .80 | .80 | 1.00 | 1.25 | 4.00 | 5.00 | 5.00 | 6.00 |
| " Float " " | .75 | .80 | .80 | 1.00 | 1.25 | 4.00 | 4.00 | 5.00 | 6.00 |

TANK CHECK VALVE

| Cina inahaa | 1 3/ | 1 | 11/ | 11/ | 1 0 | 21/6 | 9 | 91/ | 1 4 |
|-------------|------|-----|-------|---------|------|--------|------|------|----------|
| Size inches | 1 % | 1 | 1 1/4 | 1 1 1/2 | _ Z | 2/2 | o | 372 | * |
| 5 | | | | | | 2 25 | ~== | 0.05 | 0.05 |
| Price each | .75 | .75 | .90 | 1 1 (X) | 1225 | 1 2.25 | 2.75 | 3.25 | 3.25 |
| | | | | 1 2.00 | | | | | |

DIAMOND FLOAT VALVE

ENTERPRISE FLOAT VALVE





Fig. 339D

Fig. 339E

| Size | | | | | | | 3 |
|-------|------|------|------|------|------|------|-------|
| Price | each | 1.25 | 1.38 | 1.50 | 3.00 | 5.00 | 10.00 |

GALVANIZED AND COPPER FLOATS

IMPROVED SANITARY WELL CAP



Fig. 339G

GALVANIZED AND COPPER FLOATS

| Sizeinches | | 12 x3 |
|-----------------------|------|--------------|
| Price, Galvanizedeach | 1.00 | 1.50 |
| " Copper " | 1.25 | 1.75 |

IMPROVED SANITARY WELL CAPS

| For Wells | inches | 3 and 31/4 | 3 | 4 and 414 | 55% |
|-----------|----------|------------|-------|-----------|-------|
| Pricepe | | | i | | / 4 |
| Frice | er dozen | 10.00 | 10.00 | 20.30 | 30.00 |

The Improved Sanitary Well Cap prevents the breaking of threads on supply pipe; raising of pump and platform by Wind Mill; all foreign substances from dropping in well; large repair bills; surface water from getting in well; water from getting foul and unhealthy, and use of platform around well.

ROD COUPLINGS, ETC.

WROUGHT-FORGED SUCKER ROD COUPLINGS



Fig. 5156A

| Size of Rodinches | 118 | 15% | 178 | 214 | 3½ |
|--|------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Adapted for working barrel, diam., in. Price, Plain Couplingsper set "Galvanized Couplings" "Ash Rod with Couplings, per ft. | .60 .85 | 2¼ to 2¾ .75 1.15 .11 | 2¾ to 3¾ 1.30 1.75 .18 | 3¾ to 5¾ 2.00 2.60 .25 | 5¾ to 8¾ 5.00 6.00 .65 |

MALLEABLE IRON WOOD ROD COUPLINGS



Fig. 5156B

| Description | BLACK | | G | ALVANIZE | D |
|-----------------|---------------------|---------------------|------------|---------------------|----------------|
| Number of holes | 3 16.00 20.00 | 4 20.00 24.00 | 2 14.00 | 3 20.00 24.00 | 24.00 28.00 |

ROD COUPLING

HEXAGON ROD COUPLING





Pig. 5156C

ROD COUPLINGS

Fig. 5156D

| Sizeinches | 3/8, 3/8 x 1/6, 1/6 | 1/2 |
|-----------------------|---------------------|-----|
| Price, Blackper pound | .16 | .16 |
| " Galvanized" | .20 | .20 |

STEEL PUMP ROD

| Price, Polished, 38, 76 and ½-inchper pound | . 10 |
|---|------|
| " Galvanized, 3 %, 7/6 and 1/2-inch" | . 12 |

HEXAGON ROD COUPLINGS

| Sizeinches | 38 | 3/8 x 7/6 | 1/16 | 1/2 |
|---------------------------|-----|-----------|-------------|-----|
| Number of Threads to inch | 14 | 12 and 14 | 12 | 12 |
| | .16 | .16 | .16 | .16 |
| | .20 | .20 | .20 | .20 |
| | .50 | .50 | .50 | .50 |

SEATING TOOL



Fig. 5156E

| Size of Cylinderinches | 2 | 214 | 3 | 4 | 5 | 6 | 7 | - 8 |
|------------------------|-----------------|-----|------|------|------|------|-------|-------|
| Priceeach | 60 [_] | .90 | 1.20 | 2.40 | 6.00 | 8.00 | 10.00 | 12.00 |

PUMP LEATHERS. ETC.

LOWER VALVE

PLAIN PLUNGER

CRIMPED PLUNGER







Fig. 8643A

Fig. 8643B

Fig. 8643C

VALVE AND PLUNGER LEATHERS

| Size Cylinder (Inside Diameter)inches | 2 | 21/4 | 2'2 | 234 | 3 | 314 | 31/2 |
|---------------------------------------|------|------|------|-----|------|------|------|
| Price Lower Valve Leathers each | .15 | .15 | .15 | 15 | .15 | .20 | .20 |
| " Plain Plunger " " | .15 | .15 | .15 | .15 | .15 | .20 | .20 |
| " Crimped " " " | . 15 | . 15 | . 15 | .20 | . 25 | .30 | 35_ |
| Size Cylinder (Inside Diameter)inches | 334 | 4 | 41/2 | 5 | 6 | 7 | 8 |
| Price Lower Valve Leathers each | .20 | .20 | .25 | .40 | .50 | .70 | .75 |
| " Plain Plunger " " | .24 | .20 | .25 | .30 | .40 | .55 | .60 |
| " Crimped " "" | .40 | . 45 | .55 | .60 | . 75 | 1.15 | 1.25 |

In ordering lower valve leathers specify style of pump for which they are desired, or if for deep well cylinder state whether iron or brass and whether inside or outside attachments.

PUMP LEATHER-In Sides

Price, Best Oak-Tanned .

.....per pound | 1.50

VALVE BALL

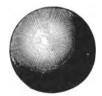


Fig. 8643D

RUBBER PACKER



Fig. 8643E

HARD RUBBER BALLS

| Diameterinches | 1 114 | 111/ | 1 11/ | 13. |
|----------------|-------|------|-------|-----|
| | - 8 | | | |
| Price each | .10 | .25 | .40 | .50 |

BRONZE BALLS

| Diameter, inches | 3 4 | 5 % | 11/16 | 34 | 7.8 | 116 | 11/8 | 114 | $1^3 \stackrel{.}{s}$ | 11/2 | 13/4 | 2 | 214 |
|------------------|----------------|------|-------|------|------|------|-------|-------|-----------------------|-------|-------|-------|-------|
| Priceeach | .30 | .30 | .30 | .35 | .35 | .45 | 50 | .70 | .90 | 1.10 | 1.40 | 2.15 | 2.75 |
| Diameter, inches | $2 lap{1}{2}$ | 234 | 3 | 314 | 4 | 414 | 41/2 | 434 | 514 | 51/2 | 6 | 63 4 | 75 % |
| Price each | 3 75 | 4.25 | 4.75 | 5.50 | 6.75 | 7 75 | 10 00 | 11 00 | $\overline{12.50}$ | 13.50 | 15.00 | 17.50 | 25.00 |

RUBBER PACKERS-For Tubular Well Valves

| Sizeinches | 2 | 21/2 | 3 | 314 | 4 | 5 | 6 |
|------------|-----|------|-----|-----|-----|------|------|
| Price each | .16 | .30 | .40 | .60 | .80 | 3.00 | 4.00 |

DRIVE SHOES AND EARTH AUGERS

DRIVE SHOES CAST STEEL

MALLEABLE IRON WITH OR WITH-OUT SHOULDERS



FORGED WROUGHT STEEL



Fig 5614A

O!-- D!--



C 1 4 D



E 0 1 4 C

| Size, Pipeinches | |
|--|--------|
| Price, Malleable Iron each | _ |
| " Cast Steel, Rough " " " Finished . " " Forged Wr'ght Steel " | 1 |
| Size, Pipeinches Price Cast Steel Rough each | = - |

" " Finished. " Forged Wr'ght Steel "

*For casing.

| E 1 | R. 9014 | . D | | FIG. DOING | | | | | | | |
|--|--|--|---|---|--|---|--|--|--|--|--|
| 2 | $\frac{21}{2}$ | 3 | 31/2 | 4 | 41/2 | 5 | *5 ⁵ 8 | | | | |
| .50 .80 1.00 | .70 1.10 1.30 | .90 1.50 2.00 | 1.20 2.50 3.50 5.00 | 1.50 2.75 4.00 | 3.75 6.00 8.00 | 4.25 7.00 | 6.50 9.00 | | | | |
| 6 | 7 | 8 | 10 | 12 | 14 | 15 | 16 | | | | |
| $ \begin{array}{r} 6.50 \\ 9.00 \\ 12.00 \end{array} $ | 15.00 | 12.00 | 36.00 | 48.00 | 70.00 | 90.00 | 110.00 | | | | |
| | $ \begin{array}{r} \hline 2 \\ .50 \\ .80 \\ 1.00 \\ 1.50 \\ \hline 6 \\ 6.50 \\ 9.00 \\ \end{array} $ | $\begin{array}{c cccc} 2 & 2\frac{1}{2} \\ \hline .50 & .70 \\ .80 & 1.10 \\ 1.00 & 1.30 \\ 1.50 & 2.50 \\ \hline 6 & 7 \\ \hline 6.50 & \\ 9.00 & \\ \end{array}$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{ c c c c c c c c c c }\hline 2 & 2!_2 & 3 & 3!_2 & 4 \\ \hline .50 & .70 & .90 & 1.20 & 1.50 \\ .80 & 1.10 & 1.50 & 2.50 & 2.75 \\ 1.00 & 1.30 & 2.00 & 3.50 & 4.00 \\ 1.50 & 2.50 & 3.50 & 5.00 & 6.00 \\ \hline \hline 6 & 7 & 8 & 10 & 12 \\ \hline 6.50 & \dots & 8.00 & \dots \\ 9.00 & \dots & 12.00 & \dots \\ \hline \end{array}$ | $\begin{array}{c c ccccccccccccccccccccccccccccccccc$ | $\begin{array}{ c c c c c c c c c c c c c c c c c c c$ | | | | |

EARTH AUGERS SPIRAL POD RIBBON TWIST



CHISEL BIT









Fig. 5614D Fig. 5614E Fig. 5614F Fig. 5614H Fig. 5614J Fig. 5614G

Hole Auger will make . . . inches 21/2 31_{2}^{2} 4 41/2 5 6 2 3 6.00 7.00 8.50 20.00 25.00 Price Chisel Bit.....each 6.50 10.00 15.0020.00 Pod..... 6.00 6.507.00 8.50 10.00 15.0025.00 15.00 20.00 25.00Ribbon..... 6.00 6.50 7.00 8.50 10.00 " 20.00 25.00 7.00 15.00 Twist..... 6.00 6.508.50 10.00 7.00 10.00 | 15.00 | 20.00 | 25.00 8.50 6.50Spiral 6.00

| w | Δ | N |
|---|---|----|
| W | m | 14 |

| Sizeinches | 3 4 | 5 6 | 7 8 | | | | |
|----------------|-------------|-----------------|-------------|-------|-------|-------|--------|
| Priceper dozen | 28.00 28.00 | $28.00 \ 28.00$ | 30,00 30,00 | 32.00 | 36.00 | 96.00 | 120.00 |

BRASS JACKET DRIVE WELL POINTS

GALVANIZED WROUGHT PIPE





Fig. 1016A

| Trade | Inside | Length | Length | | | PRICE, PE | R Dozen | | |
|-------|---------------------------------|--------------------|---------------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|
| No. | Diam. Inches | of Point Inches | of Jacket Inches | No. 60 Gauze | No. 70 Gauze | No. 80 Gauze | No. 90 Gauze | No 100 Gauze | No. 120 Gause |
| 74 | 1 | 24 | 18 | 33.00 | 40.00 | 46.00 | 52.00 | 62.00 | 74.00 |
| 76 | ī | 30 | 24 | 42.00 | 49.00 | 56.00 | 64.00 | 78.00 | 94.00 |
| 78 | ī | 36 | 30 | 51.00 | 59.00 | 66.00 | 76.00 | 94.00 | 114.00 |
| 80 | ī | 42 | 36 | 60.00 | 68.00 | 76.00 | 88.00 | 120.00 | 134.00 |
| 82 | i | 48 | 42 | 69.00 | 78.00 | 86.00 | 100.00 | 136.00 | 154.00 |
| 84 | ī | 54 | 48 | 78.00 | 87.00 | 96.00 | 112.00 | 152.00 | 174.00 |
| 86 | 114 | 20 | 14 | 30.00 | 36.00 | 42.00 | 50.00 | 64.00 | 80.00 |
| 90 | 114 | 24 | 18 | 36.00 | 44.00 | 52.00 | 60.00 | 80.00 | 105.00 |
| 94 | 11/4 | 30 | 24 | 46.00 | 55.00 | 64.00 | 75.00 | 100.00 | 130.00 |
| 98 | 114 | 36 | 30 | 56.00 | 66.00 | 76.00 | 90.00 | 120.00 | 155.00 |
| 100 | 11/4 | 42 | 36 | 66.00 | 77.00 | 88.00 | 105.00 | 140.00 | 180.00 |
| 102 | 11/4 | 48 | 42 | 76.00 | 88.00 | 100.00 | 120.00 | 160.00 | 205.00 |
| 106 | 1!4 | 54 | 48 | 86.00 | 99.00 | 112.00 | 135.00 | 180.00 | 230.00 |
| 110 | 11/4 | 60 | 54 | 96.00 | 110.00 | 124.00 | 150.00 | 200.00 | 255.00 |
| 112 | 11/4 | 66 | 60 | 106.00 | 121.00 | 136.00 | 165.00 | 220.00 | 280.00 |
| 114 | 117 | 72 | 66 | 116.00 | 132.00 | 148.00 | 180.00 | 240.00 | 305.00 |
| 136 | 11/6 | 24 | 18 | 48.00 | 57.00 | 65.00 | 78.00 | 94.00 | 112.00 |
| 140 | $\frac{11_{2}}{11_{2}}$ | 30 | 24 | 60.00 | 70.00 | 80.00 | 96.00 | 118.00 | 139.00 |
| 144 | $1\frac{1}{2}$ | 36 | 30 | 72.00 | 84.00 | 95.00 | 114.00 | 142.00 | 166.00 |
| 146 | 11/6 | 42 | 36 | 84.00 | 97.00 | 110.00 | 132.00 | 166.00 | 193.00 |
| 148 | 1 1/2 | 48 | 42 | 96.00 | 111.00 | 125.00 | 150.00 | 188.00 | 220.00 |
| 150 | $1\frac{1}{2}$ | 54 | 48 | 108.00 | 124.00 | 140.00 | 168.00 | 204.00 | 247.00 |
| 152 | 11/2 | 60 | 54 | 120.00 | 138.00 | 155.00 | 186.00 | 228.00 | 274.00 |
| 154 | 1 ½ 1 ½ 1 ½ 1 ½ 1 ½ | 66 | 60 | 132.00 | 151.00 | 170.00 | 204.00 | 252.00 | 301.00 |
| 156 | 1 1/2 | 72 | 66 | 144.00 | 165.00 | 185.00 | 222.00 | 276.00 | 328.00 |
| 160 | 2 | 24 | 18 | 75.00 | 85.00 | 94.00 | 110.00 | 130.00 | 150.00 |
| 164 | 2 | 30 | 24 | 90.00 | 101.00 | 112.00 | 132.00 | 160.00 | 185.00 |
| 168 | 2 2 2 2 2 | 36 | 30 | 105.00 | 118.00 | 130.00 | 154.00 | 190.00 | 220.00 |
| 170 | 2 | 42 | 36 | 120.00 | 134.00 | 148.00 | 176.00 | 220.00 | 255.00 |
| 172 | 2 | 48 | 42 | 135.00 | 151.00 | 166.00 | 198.00 | 250.00 | 290.00 |
| 174 | 2 | . 54 | 48 | 150.00 | 167.00 | 184.00 | 220.00 | 280.00 | 325.00 |
| 176 | 2 | 60 | 54 • | 165.00 | 184.00 | 202.00 | 242.00 | 310.00 | 360.00 |
| 178 | 2 | 66 | 60 | 180.00 | 200.00 | 220.00 | 264.00 | 340.00 | 395.00 |
| 180 | 2 | 72 | 66 | 195.00 | 217.00 | 238.00 | 286.00 | 370.00 | 430.00 |
| 184 | $\frac{21_{2}}{21_{2}}$ | 36 | 30 | 180.00 | 205.00 | 230.00 | 260.00 | 300 00 | 350.00 |
| 188 | $2\frac{1}{2}$ | 48 | 42 | 230.00 | 265.00 | 300.00 | 340.00 | 400.00 | 470.00 |
| 192 | $\frac{21_{2}^{2}}{21_{2}^{2}}$ | 60 | 54 | 280.00 | 325.00 | 370.00 | 420.00 | 500 00 | 590.00 |
| 196 | $2\frac{1}{2}$ | 72 | 66 | 330.00 | 385.00 | 440.00 | 500.00 | 600. 0 0 | 710.00 |
| 200 | 3 | 36 | 30 | 240.00 | 275.00 | 310.00 | 340.00 | 410.00 | 490.00 |
| 204 | 3 | 48 | 42 | 300.00 | 345.00 | 390.00 | 430.00 | 520.00 | 630.00 |
| 208 | 3 | 60 | 54 | 360.00 | 415.00 | 470.00 | 520.00 | 630.00 | 770.00 |
| 212 | 3 | 72 | 66 | 420.00 | 485.00 | 550.00 | 610.00 | 740.00 | 910.00 |
| 216 | 4 | 48 | 36 | 480.00 | 520.00 | 560.00 | 600.00 | 700.00 | 810.00 |
| 220 | 4 | 72 | 60 | 630.00 | 695.00 | 760.00 | 840.00 | 1000.00 | 1270.00 |
| 224 | 4 | 96 | 84 | 780.00 | 870.00 | 960.00 | 1080.00 | 1300.00 | 1610.00 |
| 228 | 4 | 120 | 108 | 930.00 | 1045.00 | □1160.00 | 1320.00 | 1600.00 | 2010.00 |

Open End or Well Extension Points same list as above.

INSIDE OR PLUSH CAP



Fig. 2118A BECTIONAL VIEW



Pig. 2118E OUTSIDE



Pig. 2118C

MYERS SEAMLESS DRAWN BRASS PUMP CYLINDERS

| T) in m | | Size | (| | Prop. From | |
|--|--------|--|-------|-------|-------------|------------------|
| Diam- eter | Length | Pipe | Glass | Brass | PRICE, EACH | All Iron Plun- |
| Inches | Inches | Inches | Seat | Seat | All Brass | ger and Ir. Seat |
| $\overline{}$ | 10 | 11/4 | | | 6.50 | •••• |
| $\overline{2}$ 1/4 | 10 | 114 | | 4.75 | 7.50 | |
| $\overline{2}$ $\overline{1}$ $\overline{3}$ | 10 | 11/2 | | 4.75 | 7.50 | 4.10 |
| 23.4 | 10 | 112 | | 5.00 | 7.75 | 4.35 |
| 3/4 | 10 | īú. | | 5.25 | 8.00 | 4.60 |
| 31/4 | 10 | 112 | 1 | 5.50 | 9.25 | 5.00 |
| 31.5 | îŏ | 112 | 1 | 5.75 | 10.00 | 5.40 |
| 4 | 10 | $\mathbf{\hat{2}}^{\prime 2}$ | | 8.75 | 13.00 | 6.65 |
| 2 | 12 | 11/ | | 0.10 | 7.00 | 0.00 |
| $\tilde{2}_{1/4}$ | 12 | 112 | | 5.25 | 8.00 | |
| $\frac{274}{21/3}$ | 12 | 11/ | 5.50 | 5.25 | 8.00 | 4.35 |
| 03/ | 12 | 11/ | 5.75 | 5.50 | 8.25 | 4.60 |
| 3 3 | 12 | 11/4 | 6.00 | 5.75 | 8.50 | 4.85 |
| 31.4 | 12 | 11/4 | 6.25 | 6.00 | 9.75 | 5.25 |
| 354 | 12 | 11/4 | 6.50 | 6.25 | 10.50 | 5.75 |
| 31/2 | 12 | $\begin{vmatrix} 1^{1}22 \\ 2 \end{vmatrix}$ | 9.50 | 9.25 | 14.00 | 7.50 |
| 4 2 | 14 | า้น | 8.50 | 0.20 | 7.50 | 7.50 |
| 21/4 | 14 | 11/4 | | 5.75 | 8.50 | •••• |
| -/- | 14 | 11/4 | 6.00 | 5.75 | 8.50 | 4.75 |
| $egin{array}{c} 2^{1} \stackrel{\frown}{}_{2} \ 2^{3} \stackrel{\frown}{}_{4} \end{array}$ | 14 | 11/4 | 6.25 | 6.00 | 8.75 | 5.00 |
| 3 4 | 14 | 117 | 6.50 | 6.25 | 9.00 | 5.25 |
| | 14 | 11/4 | 6.75 | 6.50 | 10.25 | 5.65 |
| 31/4 | 14 | 11/4 | 7.00 | 6.75 | 11.00 | 6.30 |
| 4 | 14 | $2^{1/2}$ | 10.00 | 9.75 | 14.50 | 8.05 |
| 2 | 16 | 11/ | 10.00 | 0.10 | 8.00 | 0.00 |
| 21/4 | 16 | 11/4 | | 6.25 | 9.00 | |
| 21/2 | 16 | 11/ | 6.50 | 6.25 | 9.00 | 5.25 |
| 632 | 16 | 11/4 | 6.75 | 6.50 | 9.25 | 5.50 |
| 2/4 | 16 | 11/4 | 7.00 | 6.75 | 9.50 | 5.75 |
| 31/4 | 16 | 11/ | 7.25 | 7.00 | 10.75 | 6.15 |
| 31/4 | 16 | 11/6 | 7.50 | 7.25 | 11.50 | 7.00 |
| 472 | 16 | $\frac{1}{2}$ | 10.50 | 10.25 | 15.00 | 9.00 |
| $\frac{1}{2}$ | 18 | 11/ | 10.00 | 10.20 | 8.50 | 1 5.00 |
| $\frac{2}{2}$ | 18 | 11/ | | 6.75 | 9.50 | |
| 21/2 | 18 | 112 | 7.00 | 6.75 | 9.50 | 5.75 |
| 2_{34}^{72} | 18 | 112 | 7.25 | 7.00 | 9.75 | 6.00 |
| 3 | 18 | 112 | 7.50 | 7.25 | 10.00 | 6.30 |
| 31/4 | 18 | 112 | 7.75 | 7.50 | 11.25 | 6.65 |
| 31/3 | 18 | 112 | 8.00 | 7.75 | 12.00 | 7.60 |
| 4 | 18 | 272 | 11.00 | 10.75 | 15.50 | 9.90 |
| $ar{f 2}$ | 20 | īu | | | 9.00 | 1 0.00 |
| 21/ | 20 | iú. | | 7.25 | 10.00 | l :::: |
| 213 | 20 | īú, | 7.50 | 7.25 | 10.00 | 6.30 |
| 21/ | 20 | 117 | 7.75 | 7.50 | 10.25 | 6.55 |
| 3 | 20 | 112 | 8.00 | 7.75 | 10.50 | 6.80 |
| 31/4 | 20 | 112 | 8.25 | 8.00 | 11.75 | 7.20 |
| 31% | 20 | 113 | 8.50 | 8.25 | 12.50 | 8.35 |
| 4 4 | 20 | $ \bar{2}^{\sim 2}$ | 11.50 | 11.25 | 16,00 | 10.75 |
| | | | | · | · | <u></u> |

MYERS IMPROVED PUMP CYLINDERS

BRASS LINED

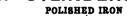








Fig. 2117

BRASS LINED-Fitted With Brass Cage and Valve

| Diam- | Length | Size | | PRICE, EA | СН | Diam- | Length | Size | | PRICE, E | ACH |
|----------------|--------|----------------|---------------|---------------|--------------|-------|--------|----------------|---------------|---------------|--------------|
| eter Inches | Inches | Pipe Inches | Glass Seat | Brass Seat | Iron Seat | eter | Inches | Pipe Inches | Glass Seat | Brass Seat | Iron Seat |
| 21/4 | 10 | 11/4 | 4.00 | 3.75 | 3.50 | 3 | 14 | 11/4 | 5.50 | 5.25 | 5.00 |
| 21/2 | 10 | 114 | 4.00 | 3.75 | 3.50 | 31/4 | 14 | 11/4 | 5.75 | 5.50 | 5.25 |
| 234 | 10 | 114 | -4.25 | 4.00 | 3.75 | 31/2 | 14 | 11/2 | 6.00 | 5.75 | 5.50 |
| 3 | 10 | 11/4 | 4.50 | 4.25 | 4.00 | 4 | 14 | 2 | 7.50 | 7.25 | 7.00 |
| 31/4 | 10 | 11/4 | 4.75 | 4.50 | 4.25 | 41/2 | 14 | 2 | 10.75 | 10.50 | 10,25 |
| $31/_{2}$ | 10 | 112 | 5.00 | 4.75 | 4.50 | 6 | 14 | 3 | | 24.00 | 23.50 |
| 4 | 10 | 2 | 6.50 | 6.25 | 6.00 | 2 | 16 | 11/4 | | 5.25 | 5.00 |
| 2 | 12 | 11/4 | | 4.25 | 4.00 | 21/4 | 16 | 11/4 | 5.50 | 5.25 | 5.00 |
| 21/4 | 12 | 114 | 4.50 | 4.25 | 4.00 | 21/2 | 16 | 11/4 | 5.50 | 5.25 | 5.00 |
| 21/2 | 12 | 11/4 | 4.50 | 4.25 | 4.00 | 23/4 | 16 | 11/4 | 5.75 | 5,50 | 5.25 |
| 2/4 | 12 | 11/4 | 4.75 | 4.50 | 4.25 | 3 | 16 | 11/4 | 6.00 | 5.75 | 5.50 |
| 3 | 12 | 11/4 | 5.00 | 4.75 | 4.50 | 31/4 | 16 | 11/4 | 6.25 | 6.00 | 5.75 |
| 31/4 | 12 | 11/4 | 5.25 | 5.00 | 4.75 | 31/2 | 16 | 11/2 | 6.50 | 6.25 | 6.00 |
| 31/2 | 12 | 11/2 | 5.50 | 5.25 | 5.00 | 4 | 16 | 2 | 8.00 | 7.75 | 7.50 |
| 4 | 12 | 2 | 7.00 | 6.75 | 6.50 | 41/6 | 16 | 2 | 11,50 | 11.25 | 11.00 |
| 41/2 | 12 | 2 | 10.00 | 9.75 | 9.50 | 5 | 16 | 21/2 | | 18.25 | 18,00 |
| 5 | 12 | 21/2 | | 14.75 | 14.50 | 6 | 16 | 3 | | 26.00 | 25.50 |
| 6 | 12 | 3 | | 22.00 | 21.50 | 3 | 18 | 11/4 | 6.50 | 6.25 | 6.00 |
| 2 | 14 | 11/4 | | 4.75 | 4.50 | 31/2 | 18 | 11/2 | 7.00 | 6.75 | 6.50 |
| 21/4 | 14 | 11/4 | 5.00 | 4.75 | 4.50 | 4 | 18 | 2 | 8.50 | 8.25 | 8.00 |
| $2^{1/2}$ | 14 | 11/4 | 5.00 | 4.75 | 4.50 | 41/2 | 18 | 2 | 12.50 | 12.25 | 12.00 |
| 234 | 14 | 11/4 | 5.25 | 5.00 | 4.75 | 6 | 18 | 3 | | 28.00 | 27,50 |

POLISHED IRON-With Iron Seat, and Plunger

| Diameter | | PRICE EA | CH, LENG | th | Diameter | PRICE EACH, LENGTH | | | | | |
|-------------------|------------|----------------|---------------------|------------|----------|--------------------|---------------------|--------------|---------------------|--|--|
| Inches | 10 inch | 12 inch | 14 inch | 16 inch | Inches | 10 inch | 12 inch | 14 inch | 16 inch | | |
| $\frac{2^{1}}{2}$ | 1.75 | 2.40 | 2.60 | 2.80 | 314 | 2.40 | 3.20 | 3.50 | | | |
| $\frac{2!4}{3}$ | 2.00 | $2.60 \\ 2.80$ | $\frac{2.80}{3.00}$ | 3.20 | 31/2 | 2.80 3.60 | $\frac{3.60}{4.60}$ | 4.00 5.00 | $\frac{4.50}{5.80}$ | | |

For list of Polished Iron Cylinders with Brass Seat, add to Iron Seat list, .25.

MYERS PUMP CYLINDERS

BRASS LINED WORKING BARREL





| Size | In the Diese | T | 1 | | Ol Di- | |
|--|-----------------------|------------------|--------|-------------------------------|----------------------|------------------|
| Well | Inside Diam. Cylinder | Length | Barrel | Capacity one Rev. of Crank | Size Pin | Price |
| Inches | Inches | Inches | Inches | Shaft, Gallons | in Plunger Inches | Complete Each |
| 2 | 113 | 10 | 23 | .12 | 5/6 | 12.00 |
| 2 | 1 | 14 | 27 | .16 | 5% | 12.50 |
| $ar{f 2}$ | 113 | 24 | 37 | .27 | € ° | 14.50 |
| $egin{smallmatrix} 2 \\ 2 \\ 2 \end{bmatrix}$ | 113 | 36 | 49 | .40 | /8 5/ | 16.50 |
| $\overline{2}$ 1/2 | 216 | 10 | 24 | .17 | 78 | 16.50 |
| $2\frac{1}{2}$ | 21/ | 14 | 28 | .24 | 78 | 17.50 |
| | 912 | 24 | 38 | .41 | 78 | 20.00 |
| 212 | 274 | 36 | 50 | .62 | 78 | 22.50 |
| 272 | 937 | 10 | 26 | .02 | 48 | 23.50 |
| 9 | 274 | 14 | 30 | | 78 | |
| ၁ | 2% | 24 | 40 | .36 | 7 8 | 25.00 |
| 2 ¹ / ₂ 2 ¹ / ₂ 3 3 3 3 | 2% | 36 | 52 | .61 | | 27.50 |
| 3 01/ | 234 | | | .92 | /8 | 31.00 |
| $\frac{31}{2}$ | 31/4 | 10 | 28 | .36 | 1/8 | 34.50 |
| 31/2 | 31/4 | 14 | 32 | .50 | ½ 8 | 35.50 |
| 312 | 314 | 24 | 42 | .86 | 7∕8 | 39.00 |
| $3\iota_2$ | 31/4 | 36 | 54 | 1.29 | 7∕8 | 43.00 |
| 4 | 334 | 10 | 28 | .48 | $\frac{7}{8}$ | 50.00 |
| 4 | $3\frac{3}{4}$ | 14 | 32 | .67 | 7/8 | 51.00 |
| 4 | 33/4 | 24 | 42 | 1.14 | 7/8 | 55.50 |
| 4 | 33/4 | 36 | 54 | 1.72 | 7 /8 | 60.00 |
| 41/2 | 41/4 | 10 | 34 | .61 | 11/8 | 62.00 |
| 4U3 | 41/4 | 14 | 38 | .86 | 11/8 | 63.00 d |
| 41/3 | 41/4 | 24 | 48 | 1.47 | 11/6 | 70.00 |
| 418 | 41/1 | 36 | 60 | 2.21 | $\overline{1}i_8$ | 74.00 |
| 5 | 43/ | 24 | 48 | 1.84 | 11% | 88.00 |
| 5 | 434 | 36 | 60 | 2.76 | 11% | 97.00 |
| 6 | 537 | 24 | - 52 | 2.69 | 11% | 126.00 |
| 6 | 534 | 36 | 64 | 4.04 | 11% | 140.00 |
| 6 7 | 634 | 24 | 56 | 3.71 | 11% | 196.00 |
| 7 | 632 | 36 | 68 | 5.57 | 112 | 212.00 |
| 8 | 77 | $\widetilde{24}$ | 58 | 4.59 | 11/2 | 290.00 |
| 8 | 7 7 | 36 | 70 | 6.88 | 112 | 306.00 |
| 9 | 116 | 24 | 60 | 5.88 | 112 | 344.00 |
| 9 | 91/ | 36 | 72 | 8.82 | 11/2 | 391.00 |
| 10 | 072 | 24 | 68 | | 11.2 | 543.00 |
| 10 | 912 | 36 | | 7.34 | $1\frac{1}{2}$ | 576.00 |
| 10 | 91/8 | 30 | 76 | 11.00 | 1.45 | 1010.00 |

EUREKA CYLINDER

| Size Inches | Length Inches | Stroke Inches | Price Complete Each |
|----------------|---|------------------|------------------------|
| 2 21,4 | $\frac{211_{2}}{221_{3}}$ | 10 | 4.80 8.00 |
| 3 2 | $\begin{array}{c} 22\sqrt{5} \\ 25 \end{array}$ | 12 | 11.00 |



WELL DRILLING TOOLS

JETTING EARTH DRILL No. 625



Fig. 9559A

HYDRAULIC ROCK DRILLS





Fig. 9559B



Fig. 9559C

TOOL STEEL SEAMLESS DRIVE SHOE

No. 393

JETTING SHOULDER DRILL No. 336



Fig. 9559D

JETTING PROCESS





Fig. 9559E DRILLS AND REAMERS

SPRING PADDY REAMER



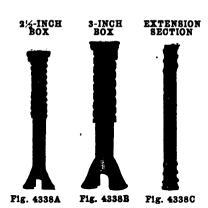
Fig. 9559F

| Diameter Pipe Drills will pass through inches | | 21/2 | | | 4 | | | | _ | 10 |
|---|------|------|-------|-------|--------------|-------|------|-------|-------|----------|
| Shank threaded for Pipeinches Price, No. 625 Jetting Barth Drilleach | 1 | 1 | 11/1 | 114 | \mathbf{z} | 2 | 21/2 | 21.5 | 3 | 4 |
| Price, No. 625 Jetting Barth Drill each | 1.00 | 1.35 | 1.50 | 2.25 | 3.00 | 4.00 | 6.00 | 7.50 | 14.50 | |
| " No. 773 Hydraulie Rock Drill" | 1.50 | 2.25 | 2.50 | 4.00 | 5.00 | 6.00 | 7.50 | 8.50 | 15.00 | 22.50 |
| " No. 745 " " " " | 1.60 | 2.75 | 3.25 | 4.00 | 4.50 | 6.00 | 9.00 | 10.00 | 18.50 | 27.50 |
| " No. 336 Jetting Shoulder Drill" | 3.15 | 4.75 | 6.00 | 7.50 | 8.50 | 10.50 | | 15.00 | | |
| " No. 361 Spring Paddy Reamer" | 6.50 | 8.50 | 13.50 | 18.50 | 20.00 | 22.50 | | | | <u>.</u> |

| TOO | LSTE | EEL | DRIV | F SHOES | 3 |
|-----|------|-----|------|---------|---|

| Sizeinches | 9 | 21% | 3 | 31/ | 4 | 41/ | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
|-------------|------|------|------|------|------|------|------|------|-------|-------|-------|-------|-------|
| Olec Inches | _ | -/2 | ., | 0/2 | | - 2 | '' | • | | | | | |
| Price each | 0 05 | 2 05 | 4.00 | 4.50 | 4.75 | 5.75 | 6 75 | 7.50 | 10.00 | 10.00 | 19 50 | 19 50 | 20 00 |
| rnce each | 4.40 | 0.20 | 4.00 | 4.00 | 4.10 | 0.10 | 0.10 | 1.00 | 10.00 | 10.00 | 12.00 | 12.00 | 20.00 |

SERVICE BOXES



COVERS, KEYS, AND BOLTS







Fig. 4338D ENLARGED BASE

Pig. 4338F

SERVICE BOXES, 21/2-INCH DIAMETER

For Service Cocks 14-inch and Smaller

| Number | 88 | 89A | 90B | 91C | 92C | 92D | 93D |
|-----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Extension inches Price each | | | | | | | |
| Number | 93E | 94D | 94E | 95E | 100E | 100F | 100G |
| Extension inches Price each | 36-54 1.66 | 42–57 1.70 | 42-60 1.80 | 48-66 2.00 | 54-72 2.10 | 54-78 2.20 | 54-90 2.50 |

STANDARD SERVICE BOXES, 3-INCH DIAMETER

| Number | | | | | | | 5 | 7 |
|-----------------------------|------|-------|-------|-------|-------|-------|-------|-------|
| Extension inches Price each | 10 | 13-21 | 18-28 | 24-39 | 32-48 | 34-58 | 42-66 | 48-72 |
| | 1.30 | 1.60 | 1.70 | 1.80 | 2.00 | 2.10 | 2.30 | 2.60 |

EXTENSION SECTIONS

| Number | 151 | 152 | 153 | 154 | 155 | 156 | 157 |
|--|------|-------|------|------|-----|------|------|
| Increasing Length of Boxinches Price, 2½-inch Diametereach | 91/2 | 161/2 | 28 | 33 | | 24 | 30 |
| " 3-inch " " | | .80 | 1.00 | 1.10 | .90 | 1.00 | 1.10 |

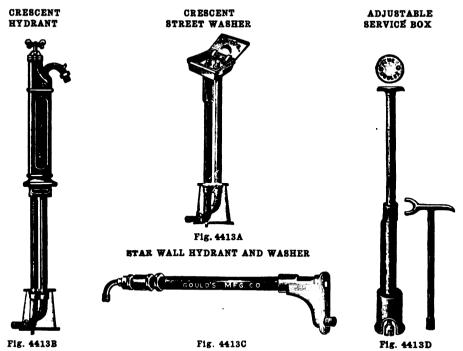
ENLARGED BASE, FOR 3-INCH BOXES To Use with 11/2 or 2-inch Inverted Key Cocks

| Price, Extra to be added to net cost of 3-inch Boxeseach | .20 |
|--|-----|

COVERS, KEYS, AND BOLTS

| Price, (| vers, Lettered "Gas," "Water," Etceach | .50 |
|----------|--|-----|
| | eys | .30 |
| | olts " | .30 |

HYDRANTS AND STREET WASHERS, ETC.



CRESCENT HYDRANTS AND STREET WASHERS

| | $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 $4\frac{1}{2}$ 5 | |
|-----------------------------|---|-------|
| Price, 34-inch Hydrantseach | 9.80 10.00 10.20 10.40 10.60 10.30 11.00 11.20 | 11.60 |
| " 34-inch Street Washers " | 8.20 8.40 8.60 8.80 9.00 9.20 9.40 9.60 | 10.00 |

STAR WALL HYDRANTS AND WASHERS

| Lengthinches | 12 | 16 | 21 | 27 |
|--|----------------------------------|-------------------|---------------|------|
| For Wallsinches | | 13 | 18 | 24 |
| Inlets for Lead or Iron Pipe, ½-inch Outlets for Hose. " Price, with Keyeach | $\substack{\frac{3}{4} \\ 4.25}$ | $\frac{34}{4.50}$ | $\frac{3}{4}$ | 5.00 |

Extra keys, each .20

ADJUSTABLE SERVICE BOXES

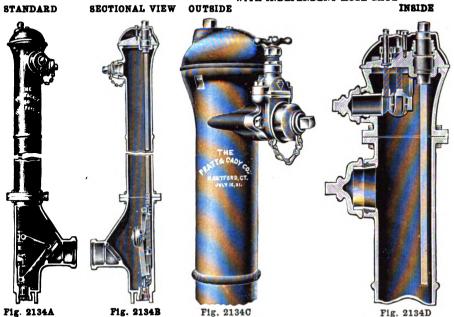
| Number | 1 | 2 | S |
|-----------------------------------|-------|-----------------------|-----------------------|
| Extension Top Section, Pipe Price | 1 | 58 to 72 1 3.40 | 70 to 84 1 3.75 |

Extra keys, each .50

FAIRBANKS FIRE HYDRANTS

PATENTED DIRECT SOLID STREAM, ANTI-FREEZING

WITH INDEPENDENT HOSE GATE



| Size | .inches | 3 | 4 | ō | 6 |
|---|---------|--------|--------|--------|-----------------|
| Diameter of Inlet Valve | inches. | 3 | 41/4 | 51/4 | 6 6, 8 or 10 |
| Size of Bell or Flange Connection for Inlet Pipe. | • " | 3 or 4 | 4 or 6 | 6 or 8 | 6,8 or 10 |
| Inside Diameter of Stand Pipe or Barrel | • " | b | 6 | 7 | 8 |
| Standard Length Pavement to Bottom Pipe | feet | อ | 9 | ð | 5 |

Prices on application.

Has a free waterway and long, easy curves. The drain is located below main valve, thoroughly draining all water from the stand pipe. Repairs can be made by simply removing four bolts that secure the head to the stand pipe. All interior working parts are of brass or are brass mounted. The operating stem and three connecting pins on which the gate and stem nut arms operate are of solid rolled tobin bronze. The main valve is a heavy beveled disc of specially moulded rubber. If ever injured can be quickly replaced. The opening and closing of the main valve is accomplished by means of a bronze nut, carrying a single toggle lever and traveling on a bronze spindle of ample strength, the threads of which are carefully chased and of the most approved form for long and hard service.

DIRECTIONS FOR ORDERING

FIRST.—Give size of valve opening and inside diameter of stand pipe.

SECOND.—Give length from surface of ground to bottom of connecting pipe.

THIRD.—Give size of bottom connecting pipe. Regular hydrants have hub or bell ends. If wanted with flange or screw ends, so state.

FOURTH.—Give number and size of nozzles.

FIFTH.—If we have not heretofore furnished hydrants to place where wanted, a sample of hose thread and size and shape of operating nut desired must always be sent us.

SIMONDS CIRCULAR SAWS

LEFT-HAND SAW

RIGHT-HAND SAW

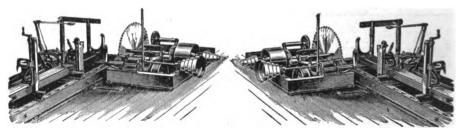


Fig. 1306A

Fig. 1306B

Standing in front of a circular saw with the saw revolving towards you, if the log passes to the right of the saw it is a Right-hand Saw; if to the left, a Left-hand Saw.

TABLE OF SPEED OF CIRCULAR SAWS

| Diameter Inches | Revolutions per Minute | Diameter Inches | Revolutions per Minute | Diameter Inches | Revolutions per Minute | Diameter Inches | Revolutions per Minute |
|--------------------|---------------------------|--------------------|---------------------------|--------------------|---------------------------|--------------------|---------------------------|
| 8 | 4500 | 26 | 1384 | 44 | 840 | 62 | 575 |
| 10 | 36 00 | 28 | 1285 | 46 | 800 | 64 | 550 |
| 12 | 3000 | 30 | 1200 | 48 | 750 | 66 | 545 |
| 14 | 2585 | 32 | 1120 | 50 | 725 | 68 | 529 |
| 16 | 2222 | 34 | 1050 | 52 | 700 | 70 | 514 |
| 18 | 2000 | 36 | 1000 | 54 | 675 | 72 | 500 |
| 20 | 1800 | 38 | 950 | 56 | 650 | ۱ | |
| 22 | 1636 | 40 | 900 | 58 | 625 | | |
| 24 | 1500 | 42 | 870 | 60 | 600 | ١ | |

RULES FOR CALCULATING THE SPEED OF SAWS, PULLEYS OR DRUMS

PROBLEM 1. The diameter of the driven being given, to find its number of revolutions.

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the diameter of the driven; the quotient will be the number of revolutions of the driven.

PROBLEM 2. The diameter and revolutions of the driver being given, to find the diameter of the driven, that shall make any given number of revolutions in the same time.

Rule.—Multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions of the driven; the quotient will be its diameter.

PROBLEM 3. To ascertain the size of the driver.

Rule.—Multiply the diameter of the driven by the number of revolutions you wish it to make, and divide the product by the revolutions of the driver; the quotient will be the size of the driver.



SIMONDS SOLID TOOTH CIRCULAR SAWS



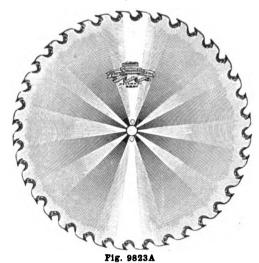
| E4 | O | 28 | C | o | D |
|----|---|----|---|---|---|
| | | | | | |

| | | | | | 116 | . 2000B | | | | | |
|---|--|---|--|---|--|--|--|---|--|--|--|
| Diameter Inches | Thickness Gauge | Size of Hole Inches | Price, Each | Price Extra for Each Additional Gauge (Heavier) | Price for Beveling New Saws per Gauge | Diameter Inches | Thickness Gauge | Size of Hole Inches | Price, Each | Price Extra for Each Additional Gauge (Heavier) | Price for Bevel- ing New Saws per Gauge |
| 111/2 21/2 31/2 5 6 7 8 9 10 11 12 14 16 18 20 22 24 26 28 30 32 | 24 24 23 22 21 20 19 18 18 18 17 16 16 15 14 13 13 12 11 11 | 8 8 8 8 8 2 2 2 4 4 4 4 4 8 8 1 1 1 1 5 1 1 1 1 1 5 1 8 1 1 1 1 1 | 1.00 1.00 1.00 1.00 1.00 1.20 1.50 1.80 2.10 2.40 2.80 3.30 3.90 4.40 9.55 8.00 9.55 8.00 9.55 11.50 13.50 | | | 36 38 40 42 44 46 50 52 54 56 60 62 64 66 68 70 72 74 78 80 | 9998888777777666655555555555555555555555 | 15 15 8 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 31.00 35.00 41.00 55.00 65.00 75.00 85.00 95.00 105.00 120.00 135.00 170.00 190.00 235.00 235.00 300.00 340.00 390.00 550.00 | 1.80 2.00 2.60 3.00 3.50 4.50 6.00 7.00 8.00 10.00 12.00 15.00 21.00 21.00 21.00 21.00 33.00 | 1.70 1.85 2.20 2.40 2.60 2.80 3.25 3.50 3.75 4.65 5.00 5.35 5.75 6.15 6.55 7.00 7.50 8.10 8.80 |
| 30 32 | 10 10 | 11/2 | 21.00 | 1.15 1.30 | 1.30 1.40 | 82 84 | 5 5 | $\frac{5}{2}$ | 640.00 730.00 | 43.00 48.00 | 9.60 10.50 |
| 34 | 9 | $1^{\frac{1}{6}}$ | | 1.50 | 1.55 | | | . . | | | |

All saws of odd diameter, not listed, take price of next larger size listed. Circular saws for bone, horn and ivory, add 50 per cent to above list. No extra charge for saws one gauge thicker than list, or one, two or three gauges thinner than list; when more than three gauges thinner, add 5 per cent to list for each gauge. Circular saws 48 inches and larger, thinner than 10 gauge are not warranted. Saws 42 inches or less in diameter beveled one gauge without extra charge; 44 inches or larger, beveled two gauges without extra charge. Saws hollow-ground or concaved, add for each gauge hollow-ground or concaved double the list for beveling.

SIMONDS INSERTED TOOTH CIRCULAR SAWS

STYLE B. F AND D



Price for Beveling New Saws, per Gauge Price for Beveling New Saws, per Gauge Extra forEach Additional Gauge (Heavler) Extra forEach Additional Gauge (Heavler) Size of Hole Inches Each Size of Hole Inches Thickness Gauge No. Thickness Gauge No. Price Each Diameter Inches Diameter Inches rice, .20 .25 7 12 19.00 .35 22222222222 96.00 3.00 2.40 11 1 44 118 118 114 114 114 1138 1158 1158 2 2.60 11 22.00 7 104.00 3.50 14 .40 46 .30 2.80 25.50 113.00 16 11 .50 7 7 4.00 48 28.50 18 .40 3.00 11 .60 50 127.00 4.50 20 22 24 32.00 .50 6 11 .70 52 148.00 5.00 3.25 11 36.50 .60 .80 **54** 6 165.00 6.00 3.50 11 40.00 .70 .90 6 180.00 7.00 3.75 56 26 200.00 4.05 10 44.00 .85 1.05 58 6 8.00 $\tilde{\mathbf{28}}$ 10 48.00 1.00 1.20 60 220.00 9.00 4.35 5 5 5 **3**0 10 52.00 1.151.30 62 245.00 10.00 4.65 $\tilde{3}\tilde{2}$ 9 58.00 1.30 275.00 12.00 5.00 1.40 64 34 9 5 300.00 63.00 1.50 1.55 66 15.00 5.35 36 69.00 $\bar{2}$ 325.00 18.00 8 1.80 1.70 68 5 5.75 38 8 74.00 2.00 1.85 70 4 $rac{ar{2}}{2}$ 355.00 21.00 6.15 40 8 80.00 2.30 2.00 72 4 390.00 24.00 6.55 2.60 2.20 42 89.00

Two extra shanks furnished with saws 40 inches diameter and less.

Three extra shanks furnished with saws 42 inches diameter and over.

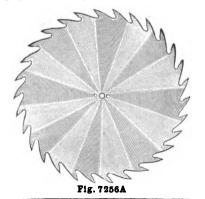
Points 6 cents each.

Shanks 60 cents each.

Extra wrenches 1.00 each, net.
For changing over Solid Saws into Isnerted Point Saws, 1.50 per tooth plus one half the list price of Solid Tooth Saws of same size, this price being based on size the saw will cut to, and subject to same discount as Inserted Point Saws.



DISSTON SOLID TOOTH CIRCULAR SAWS



| Dismeter Inches | Thickness Gauge | Size of Hole Inches | Price, Each | Price Extra for Each Additional Gauge (Heavier) | Price for Bevelling New Saws (Grind- ing or Beveling Old Saws Extra), per Gauge | Diameter Inches | Thickness Gauge | Size of Hole Inches | Price, Each | Price Extra for Each Additional Gauge (Heavier) | Price for Beveling New Saws (Grind- ing or Beveling Old Saws Extra), per Gauge |
|---|--------------------|---|----------------------|--|---|--------------------|-----------------------|--|-------------------------|---|--|
| 1 1½ 2 2½ 3 3½ 4 5 6 7 | 24 24 23 | 3\3\3\3\4\1\3\3\3\3\7\7\7\7\8\8\8\8\8\8\8\8\8\8\8\8 | 1.00 1.00 1.00 | .01 .01 .01½ | .06 .07 .08 .09 .10 .12 .14 .16 .18 .20 .22 .25 .28 .30 .35 .40 .50 .60 .70 | 36 38 40 | 9 9 | 15/8/8 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | 31.00 35.00 41.00 | 1.80 2.00 2.30 2.60 | 1.70 1.85 2.00 2.20 2.40 2.60 2.80 3.00 3.25 3.50 3.75 |
| 21/2 | 22 21 | 3/8 | 1.00 1.00 | .01½ .02½ .02½ .03 .03 .04 .05 .06 .10 .12 .16 .20 .25 .30 .40 .50 .60 .70 .85 1.00 | .09 | 42 44 | 8 8 8 7 7 | 2 | 47.00 55.00 | $\frac{2.60}{3.00}$ | 2.20 |
| 31.4 | 20 | 1/2 | 1.00 | 03/2 | 12 | 46 | 8 | 2 | 65.00 | 3.50 | 2.40 |
| 4 | 20 19 | 3/4 | 1.20 | .03 | .14 | 48 | 8 | $oldsymbol{ar{2}}$ | 75.00 | 4.00 | 2.80 |
| 5 | 19 | 3,4 | 1.50 | .04 | .16 | 48 50 52 | 7 | $ar{2}$ | 85.00 | 4.50 | 3.00 |
| 6 | 18 | 3/4 | 1.80 | .05 | .18 | 52 | | 2 | 95.00 | 5.00 | 3.25 |
| 7 | 18 | 3/4 | 2.10 | .06 | .20 | 54 | 7 | 2 | 105.00 | 6.00 | 3.50 |
| 8 | 18 | 78 | 2.40 | .08 | .22 | 56 | 7 | 2 | 120.00 | 7.00 | 3.75 |
| 9 | 17 | | 2.80 | .10 | .25 | 58 | 7 | 2 | 135.00 | 8.00 | 4.05 |
| 10 11 | 16 | 1 | 3.30 | .12 | .28 | 60 62 | 6 6 | 2 | 150.00 | 9.00 | 4.35 |
| 11 12 | 16 15 | 1 1 | 3.90 4.40 | .10 | 95 | 64 | 6 | 2 | 170.00 190.00 | 10.00 | 4.05 4.35 4.65 5.00 5.35 5.75 6.15 6.55 7.00 |
| 14 | 14 | 11/ | 5.30 | 95 | .30 | 66 | 6 | 5 | 210.00 | $12.00 \\ 15.00$ | 5.00 |
| 14 16 18 | 14 | 112 | 6.50 | 30 | 50 | 68 | 655555555 | 2 | 235.00 | 18.00 | 5.75 |
| 18 | 13 | 118 | 8.00 | .40 | .60 | 68 70 | 5 | 2 | 265.00 | 21.00 | 6 15 |
| 20 | 13 13 | 15% | 9.50 | .50 | .70 | 72 | 5 | $\bar{2}$ | 300.00 | 24.00 | 6.55 |
| 20 22 24 26 | 12 | 15% | 11.50 | .60 | .80 | 74 | 5 | $\bar{2}$ | 340.00 | 27.00 | 7.00 |
| 24 | 11 | 138 | 13.50 | .70 | .90 1.05 | 76 | 5 | 2 | 390.00 | 30.00 | 7.50 |
| 26 | 11 | 13.8 | 16.00 | .85 | 1.05 | 78 | 5 | 2 | 465.00 | 34.00 | 8.10 |
| 28 | 10 | 11/2 | 18.50 | 1.00 | 1.20 | 80 | 5 | 2 | 550.00 | 38.00 | 8.10 8.80 9.60 |
| 30 | 10 | 11/2 | 21.00 | 1.15 | 1.30 | 82 | 5 | 2 | 640.00 | 43.00 | 9.60 |
| 28 30 32 34 | 10 | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | | 1.30 | 1.40 | 84 | 5 | 2 | 730.00 | 48.00 | 10.50 |
| 34 | 9 | 15 8 | 27.00 | 1.50 | 1.55 | l | | _ <u></u> | • • • • | • • • • | |

No extra charge for saws one gauge thicker than list.

No extra charge for saws one, two or three gauges thinner than list: when more than three gauges thinner, add 5% to list for each gauge.

Circular saws 48 inches and larger, thinner than 10 gauge, not warranted.

Circular saws 42 inches or less in diameter beveled one gauge without extra charge;

44 inches or larger, beveled two gauges without extra charge.

DISSTON SAWS

CHISEL TOOTH No. 3



Fig. 7257A

| Diameter Inches | Thickness Gauge | No. of Teeth | Size of Hole Inches | Price Each | Price Extra for Each Additional Gauge Heavy | Price for Beveling New Saws (Grinding or Beveling Old Saws extra | |
|--------------------|--------------------|-----------------|---|---------------|--|---|-----|
| 12 | 11 , | 10 | 1 | 19.00 | .20 | .35 | 100 |
| 14 | 11 | 10 | 11/8 | 22.00 | .25 | . 40 | 100 |
| 16 | 11 | 12 | 11/8 | 25.50 | .30 | .50 | 100 |
| 18 | 11 | 14 | 114 | 28.50 | .40 | .60 | 100 |
| 20 | 11 | 14 | 1516 | 32.00 | .50 | . 70 | 100 |
| 22 | 11 | 16 | 1516 | 36.50 | .60 | . 80 | 100 |
| 24 | 11 | 18 | 13/8 | 40.00 | .70 | .90 | 100 |
| 26 | 10 | 18 | 13/8 | 44.00 | .85 | 1.05 | 100 |
| 28 | 10 | 20 | 11/2 | 48.00 | 1.00 | 1.20 | 100 |
| 30 | 10 | 20 | 11/2 | 52.00 | 1.15 | 1.30 | 100 |
| 32 | 9 | 22 | 15% | 58.00 | 1.30 | 1.40 | 200 |
| 34 | 9 | 22 | 15/8 | 63.00 | 1.50 | 1.55 | 200 |
| 36 | 8 | 24 | 15/8 | 69.00 | 1.80 | 1.70 | 200 |
| 38 | 8 | 24 | 15/8 | 74.00 | 2.00 | 1.85 | 200 |
| 40 | 8 | 26 | 2 | 80.00 | 2.30 | 2.00 | 200 |
| 42 | 8 | 28 | 2 | 89.00 | 2.60 | 2.20 | 200 |
| 44 | 7 | 30 | 2 | 96.00 | 3.00 | 2.40 | 200 |
| 4 6 | 7 | 30 | 2 | 104.00 | 3.50 | 2.60 | 200 |
| 4 8 | 7 | 32 | 2 | 113.00 | 4.00 | 2.80 | 200 |
| 50 | 7 | 34 | 2 | 127.00 | 4.50 | 3.00 | 200 |
| 52 | 6 | 3 6 | 2 | 148.00 | 5.00 | 3.25 | 200 |
| 54 | 6 | 38 | 2 | 165.00 | 6.00 | 3.50 | 300 |
| 56 | 6 | 40 | 2 | 180.00 | 7.00 | 3.75 | 300 |
| 58 | 6 5 5 5 | 42 | 2 | 200.00 | 8.00 | 4.05 | 300 |
| 60 | 5 | 42 | 2 | 220.00 | 9.00 | 4.35 | 300 |
| 62 | 5 | 44 | 2 | 245.00 | 10.00 | 4.65 | 300 |
| 64 | 5 | 44 | 2 | 275.00 | 12.00 | 5.00 | 300 |
| 66 | 5 | 48 | 2 | 300.00 | 15.00 | 5.35 | 300 |
| 6 8 | 5 | 48 | 2 | 325.00 | 18.00 | 5.75 | 300 |
| 7 0 | 4 | 52 | 2 | 355.00 | 21.00 | 6.15 | 300 |
| 72 | 4 | 52 | 2 | 390.00 | 21.00 | 6.55 | 300 |

Two extra holders and a wrench included with saws 40 inches or less in diameter. Three extra holders and a wrench included with saws 42 inches or over in diameter. Duplicate points, 5,00 per hundred. Duplicate holders, 40 cents each. Saws one to three gauges thinner than listed, no extra charge; saws 48 inches and larger and thinner than No. 10 gauge not warranted, and add 10 per cent for each gauge thinner than No. 10.

SIMONDS SHINGLE AND HEADING SAWS





| Diameter inches | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 |
|-----------------|-------|--------|--------|--------|--------|--------|--------|--------|
| Priceeach | 32.00 | 35.00 | 38.00 | 42.00 | 47.00 | 53.00 | 65.00 | 72.00 |
| Diameterinches | 46 | 48 | 50 | 52 | 54 | 56 | 58 | 60 |
| Priceeach | 85.00 | 100.00 | 115.00 | 135.00 | 155.00 | 175.00 | 195.00 | 215.00 |

WHEN ORDERING SHINGLE SAWS. GIVE FOLLOWING SPECIFICATIONS

Above list is for saws beveled not more than 8 gauges, and with thickness at center of same gauge as shown in Solid Tooth Circular Saws list of same diameter, but one gauge thicker is allowed without extra charge.

For any additional thickness or beveling, add for each gauge thicker or gauge bev-

eling as per Solid Tooth Saw list.

When ordering shingle or heading saws give the following specifications: Diameter of saw in inches; thickness or gauge at center and at rim; number of teeth: right or left hand: speed of saw: name of maker or machine and size of flange.

If new flange is required, send full size template of old flange, showing size and

location of all holes.

If saw only is required, send the old flange to us to be fitted to the saw, or if this cannot be done, send template of hole and a sample screw by which to drill the countersink saw.

COLLAR FOR SHINGLE AND HEADING SAWS OR RESAWS

New cast iron flanges for standard makes of shingle machines titted to new saws 1.50 per inch in diameter.

New steel flanges 8 inches to 26 inches in diameter, 3 4-inch thick or less, fitted to new saws, either with screws or rivets, 1.00 per inch.

Flanges other than above, special price. Fitting old flanges to new saws, 2.00 each, net.

SIMONDS RE-SAWING OR SIDING SAWS, ETC.

GROUND TAPERING

| Diameter Inches | Gauge | Price, Each | Diameter Inches | Gauge | Price, Each |
|--------------------|-------|-------------|--------------------|-------|-------------|
| 16 | 13x17 | 8.00 | 28 | 9x13 | 22.10 |
| 16 | 12x16 | 8.30 | 28 | 9x14 | 23.30 |
| 16 | 11x15 | 8.60 | 28 | 8x13 | 24.30 |
| 18 | 12x16 | 9.80 | 30 | 9x13 | 24.90 |
| 18 | 11x15 | 10.20 | 30 | 9x14 | 26.20 |
| 18 | 12x17 | 10.40 | 30 | 8x13 | 27.35 |
| 20 | 12x16 | 11.60 | 32 | 9x13 | 28.20 |
| 20 | 11x15 | 12.10 | 32 | 9x14 | 29.60 |
| 20 | 12x17 | 12.30 | 32 | 8x13 | 30.90 |
| 22 | 11x15 | 13.90 | 34 | 9x13 | 31.65 |
| 22 | 10x14 | 14.50 | 34 | 8x13 | 33.20 |
| 22 | 11x16 | 14.70 | 34 | 8x14 | 34.75 |
| $\overline{24}$ | 10x14 | 16.20 | 36 | 8x13 | 37.80 |
| $\overline{24}$ | 9x13 | 16.90 | 36 | 8x14 | 39.50 |
| $ar{24}$ | 10x15 | 17.10 | 36 | 7x14 | 43.00 |
| 26 | 10x14 | 19.15 | 38 | 8x12 | 40.55 |
| 26 | 9x13 | 20.00 | 38 | 8x13 | 42.40 |
| 26 | 10x15 | 20.20 | 38 | 7x13 | 46.25 |

List prices of all re-saws are figured by using Solid Tooth Circular Saw list, adding extra gauges heavy and gauges beveling, allowing one gauge heavier than standard and one gauge beveling on saws 42 inches and less in diameter, and two gauges on saws 44 inches and over, without extra charge.

EDGER SAWS, SOLID TOOTH

| Gauge | DIAMETER, INCHES | | | | | | | | |
|-------|------------------|------|------|------|-------|-------|-------|--|--|
| Gauge | 12 | 14 | 16 | 18 | 20 | 22 | 24 | | |
| 8 | 5.60 | 6.55 | 8.00 | 9.60 | 11.50 | 13.30 | 14.90 | | |
| 9 | 5.40 | 6.30 | 7.70 | 9.20 | 11.00 | 12.70 | 14.20 | | |
| 10 | 5.20 | 6.05 | 7.40 | 8.80 | 10.50 | 12.10 | 13.50 | | |
| 11 | 5.00 | 5.80 | 7.10 | 8.40 | 10.00 | 11.50 | 13.50 | | |
| 12 | 4.80 | 5,55 | 6.80 | 8.00 | 9.50 | 11.50 | 13.50 | | |

Digitized by Google

SIMONDS CONCAVE SAWS

LEFT HAND SAW

RIGHT HAND SAW

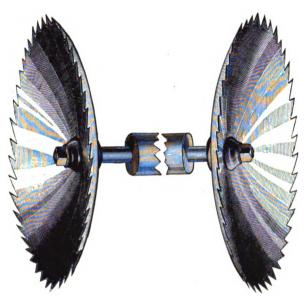


Fig. 1310A

| Diameterinches | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|------|---|-------------------|-------------------|--|-------------------|-------------------|
| Gaugeeach " Extra for each Additional Gauge | 2.30 | 16 2.40 .05 | 16 2.50 .05 | 15 2.90 .06 | 15 3.30 .08 | 15 3.80 .10 | 14 4.60 .12 |
| Diameterinches | 11 | 12 | 14 | 16 | 18 | 20 | ···· |
| Gaugeeach | 5.40 | $\begin{array}{c} 14 \\ 6.20 \end{array}$ | 13 7.60 | 13 9.50 | $\begin{array}{c} 12 \\ 11.30 \end{array}$ | | •••• |
| " Extra for each Additional Gauge | .16 | .20 | . 25 | .30 | .40 | .50 | |

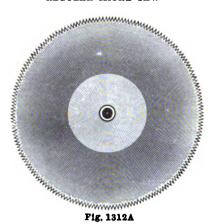
Saws concaved to a smaller circle than 16 inches, extra price.

When ordering Concave Saws give circle to be dished to; or give the diameter of the old saw and the amount of drop in the old saw, accurately measured; also give the greatest diameter of the heading to be cut. State which side is to be dished or concaved, right or left hand, as the saw runs towards you.

SIMONDS CIRCULAR MITRE SAWS HOLLOW GROUND

REGULAR MITRE SAW

NOVELTY MITRE SAW SPLITTING AND CUT-OFF



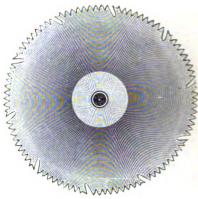


Fig. 1312A

| == | | | | | | | | | | | |
|-----------------|---------------------|----------------------|---------------|--------------------------|---|-------|---------------------|----------------------|---------------|-----|---|
| Diam. Inches | Gauge at Hole | Gauge at Teeth | Price Each | Each Gauge Heavier | Price Extra for Each Ad- ditional Gauge Beveling | Diam. | Gauge at Hole | Gauge at Teeth | Price Each | | Price Extra for Each Ad- ditional Gauge Beveling |
| 4 | 18 | 18 | 3.00 | .03 | .14 | 12 | 14 | 14 | 8.30 | .20 | .35 |
| 5 | 17 | 17 | 3.60 | .04 | .16 | 14 | 13 | 13 | 9.80 | .25 | .40 |
| 6 | 17 | 17 | 4.20 | .05 | .18 | 1.6 | 13 | 13 | 11.60 | .30 | .50 |
| 7 | 16 | 16 | 4.80 | .06 | .20 | 18 | 12 | 12 | 13.70 | .40 | .60 |
| 8 | 16 | 16 | 5.40 | .08 | .22 | 20 | 12 | 12 | 16.20 | .50 | . 70 |
| 9 | 15 | 15 | 6.00 | .10 | .25 | 22 | 11 | 11 | 19.00 | .60 | .80 |
| 10 | 15 | 15 | 6.70 | .12 | .28 | 24 | 11 | 11 | 22.00 | .70 | .90 |
| 11 | 14 | 14 | 7.50 | . 16 | .30 | | | | | | |

These Saws are ground to run without set, and are especially adapted to smooth cutting, such as cabinet and cigar box work.

Above list includes filing teeth, so that saw is ready for use.



Fig. 1312C

| | | | Тніск | NESS, IN | СНЕВ | | |
|----------|------|------|---------|----------|--------|-------|-------|
| Diameter | 1/8 | 316 | 1/4 | 5/6 | 3.8 | 7,6 | 14 |
| Inches | | | PACE OF | ТЕЕТИ. | INCHES | | |
| | 1/2 | 1 | 1 | 1!4 | 116 | 134 | 2 |
| 4 | 1.80 | 2.50 | 4.80 | 5.50 | 6.20 | 6.80 | 7.60 |
| 6 | 2.30 | 3.20 | 6.40 | 7.30 | 8.20 | 9.10 | 10.00 |
| 7 | 2.70 | 3.70 | 7.20 | 8.20 | 9.20 | 10.20 | 11.20 |
| 8 | 3.20 | 4.30 | 8.00 | 9.20 | 10.40 | 11.60 | 12.70 |
| 9 | 3.80 | 5.00 | 9.00 | 10.30 | 11.60 | 12.90 | 14.30 |
| 10 | 4.40 | 5.80 | 10.00 | 11.40 | 12.90 | 14.40 | 15.90 |
| 12 | 5.70 | 7.70 | 12.00 | 13.80 | 15.60 | 17.40 | 19.20 |

GROOVING SAWS

Bevel Grooving Saws, add 10 per cent to above prices. Grooving Saws with teeth shaped and backed off, add 50 per cent to above prices. Special Grooving Saws made to order, special prices.

SIMONDS BAND SAWS

WIDE BAND SAW



Fig. 7258A

NARROW BAND SAW



Fig. 7258B

WIDE BAND SAWS

| Width Inches | Gauge | Price, per Foot | Width Inches | Gauge | Price, per Foct |
|--------------|----------------|-----------------|--------------|----------|-----------------|
| 2 | 18 to 20 | .80 | 9 | 14 to 16 | 3.60 |
| 21/2 | 18 " 20 | 1.00 | 10 | 14 " 16 | 4.00 |
| 3 - | 18 " 20 | 1.20 | 11 | 14 " 16 | 4.50 |
| 31/2 | 18 " 20 | 1.40 | 12 | 13 " 15 | 5.00 |
| 4 | 17" 19 | 1.60 | 13 | 13 " 15 | 6.00 |
| 41/2 | 17"1 9 | 1.80 | 14 | 13 " 15 | 7.00 |
| 5 | 17 " 19 | 2.00 | 15 | 12 " 14 | 8.50 |
| 51/2 | 17 " 19 | 2.20 | 16 | 12 " 14 | 10.00 |
| 6 | 17 " 19 | 2.40 | 17 | 12 " 14 | 14.00 |
| 7 | 16 " 18 | 2.80 | 18 | 12 " 14 | 18.00 |
| 8 | 14 " 16 | 3.20 | l l | | |

Saws of odd widths, not listed, take price of next wider size listed. Saws of heavier gauge than listed, add 5% to list for each gauge heavier. No extra charge for saws one or two gauges thinner than list; when more than two gauges thinner, add 5% to list for each gauge.

DOUBLE-EDGE BAND SAWS

Add 10 per cent to list of Single Edge Band Saws.

NARROW BAND SAWS

| Width Inches | Gauge | Number of Teeth to Inch | Price per Foot | Width Inches | Gauge | Number of Teeth to Inch | Price per Foot |
|-----------------|----------|-------------------------------|-------------------|------------------|----------|-------------------------------|-------------------|
| 1/8 | 22 or 23 | 6 or 7 | .07 | 7/8 | 20 or 21 | 2! 4 or 3 | .17 |
| *8 3/16 | 21 " 22 | 6 | .08 | 1 | 20 " 21 | 1/2 or 5/g-in. pt. to pt. | .19 |
| 1/2 | 21 " 22 | 5 or 6 | .09 | 11/8 | 19 " 20 | 1/2 " 5/8 " " " " " | .21 |
| 3/8 | 21 " 22 | 4 or 5 | .10 | 117 | 19 " 20 | 1/2,5/8 " 34" " " " " | .23 |
| 1/2 | 21 " 22 | 314 or 4 | .11 | 13/8 | 19 " 20 | 12,58 " 34 " " " " | .26 |
| 5 2 | 20 " 21 | $3,3\frac{1}{2}$ or 4 | .13 | 11/2 | 19 " 20 | 1 " 114" " " " | .29 |
| 34 | 20 " 21 | $2^{1} \le \text{ or } 3$ | .15 | $13\overline{4}$ | 19 " 20 | 1 " 1) 7" " " " | .32 |

Filing and setting narrow Band Saws, 4 cents per foot extra.

BRAZING

| Widthinches | 16 to 1/2 | 5 to 7/8 | 1 to 11/4 | 13 % to 13/4 |
|-------------|-----------|----------|-----------|--------------|
| Price | .15 | .20 | .25 | .30 |

SAWS

BUTTING OR DRAG SAWS

MILL TOOTH

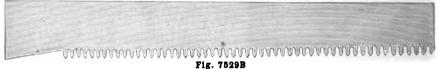


Fig. 7529A

| Gauge Number | | | | | | 10 | 11 | 12 | 13 | | | |
|--------------|---------------|------|-------|-------|-----|-----|-------|----------|------|------|------|------|
| Price, | Fapere | 1 8- | inch, | butt, | 6-i | nch | Point | per foot | 1.25 | 1.20 | 1.20 | 1.20 |
| " | " | 6 | " | " | 4 | " | " | | 1.15 | 1.10 | 1.05 | 1.05 |

Tapered Drag Saws wider or thicker than above will be figured by the Lance Tooth Drag Saw list, using the average width as the basis.

LANCE TOOTH DRAG SAWS



| Gau | ge Nu | ımbe | | | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|----------|------|----|---|---|----|--------------|--------------|--|--------------|--------------|--------------|--------------|
| ** | 14 | " | 44 | e | - | 44 | 5.60 | 6.20 5.20 | 5.70 4.80 | 5.20 4.40 | 4.80 4.00 | 4.40 3.60 | 4.00 3.30 |
| " | 12 11 | " | " | | | " | 4.80 4.30 | 4.40 4.00 | $\begin{vmatrix} 4.00 \\ 3.70 \end{vmatrix}$ | 3.60 3.30 | 3.30 3.00 | 3.00 2.70 | 2.70 2.40 |
| " | 10 9 | " | " | | | " | 3.90 3.60 | 3.60 3.30 | 3.30 3.00 | 3.00 2.70 | 2.70 2.40 | 2.40 2.20 | 2.20 2.00 |
| 44 | 8 | " | " | | | " | 3.30 | 3.00 | 2.70 | 2.40 | 2.20 | 2.00 | 1.80 |

If saws are set and sharpened, add to list price as follows: 5 gauge and thicker, 40 cents per foot: 6 to 10 gauge inclusive, 30 cents per foot.

FELLOE WEBS

Fig. 7529C

| Lengthinches | 6 | 7 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|-------------------------------|----------|---------|---------|---------|---------|---------|---------|--------|-------|
| Gauge Number | 19 | 19 | 19 | 18 | 18 | 17 | 17 | 17 | 17 |
| Widthinches Priceper dozen | 3/16-1/2 | 3/6-1/2 | 3/6-1/2 | 3/6-1/2 | 1/4-1/2 | 1/4-3/4 | 1/4-5/8 | 14-5/8 | 14-34 |
| Priceper dozen | 1.50 | 1.60 | 1.70 | 1.90 | 2.10 | 2.40 | 2.75 | 3.10 | 3,45 |
| Lengthinches | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | |
| Gauge Number | 17 | 17 | 17 | 17 | 16 | 16 | 16 | 16 | |
| Widthinches Priceper dozen | 14-34 | 1/4-7/8 | 1/4-7/8 | 1/4-1 | 1/4-1 | 14-1 | 1/4-1 | 1/4-1 | |
| Priceper dozen | 3.85 | 4.25 | 4.65 | 5.15 | 5.65 | 6.15 | 6.65 | 7.15 | |

Other than Standard Sizes will have to be manufactured special.

Special prices for all saws other than the above sizes.

N. B.-All Web Saws one-eighth inch and narrower will be made with wide ends in order to give strength at the hole, twenty-five per cent advance; with pins, 50 cents per dozen additional list.

SIMONDS CROSS-CUT SAWS

CRESCENT GROUND

No. 13



Pig. 8591 A

No. 22

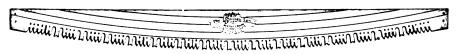


Fig 8501R

| Length feet | 4 | 41/2 | 5 | 51 2 | 6 | 61 2 | 7 | 7! 2 | 8 |
|-------------|------|------|------|------|------|------|------|------|-------|
| Priceeach | 3.00 | 3.60 | 4.30 | 5.10 | 5.90 | 6.80 | 7.80 | 8.90 | 10.00 |

No. 212. HOLLOW BACK



Fig. 8591C

| Lengthfeet | 4 | 41/ | | 51/ | l c | C1 / | 7 | 71/ | l o |
|------------|---------------|------|------|------|------|------|------|---------|--------|
| Lengthieet | '1 | 479 | U | 01/9 | ט ו | 01/9 | | 1 1/2 | |
| | | | | | | | | | |
| Drive oneh | 1 1 100 | 1 95 | 1 50 | 1 05 | 1 00 | 1 05 | 0 10 | 0.05 | 0 40 |
| rriceeach | 1.40 | 1.50 | 1.50 | 1.00 | 1.00 | T.80 | 2.10 | [Z,Zi) | 1 2.40 |
| Priceeach | 1.20 | 1.30 | 1.50 | 1.60 | 1.80 | 1.90 | 2.10 | 2.20 | 2.40 |

No. 214. HOLLOW BACK



Fig. 8591D

| Length feet | 4 | 41/2 | 5 | 51/2 | 6 | 61/2 | 7 | 71/2 | 8 |
|-------------|------|------|------|------|------|------|------|------|------|
| Priceeach | 1.50 | 1.70 | 1.90 | 2.10 | 2.30 | 2.50 | 2.70 | 2.90 | 3.10 |

No. 112. ONE-MAN SAW



Fig. 8591E

| Lengthfeet | 3 | $3\frac{1}{2}$ | 4 | 41/2 | 5 | 51/2 |
|------------|------|----------------|------|------|------|------|
| Priceeach | 2.25 | 2.65 | 3.00 | 3.40 | 3.75 | 4.15 |

DISSTON CROSS-CUT SAWS

ORIOLE



GREAT SOUTHERN



TOLEDO BLADE



CARIBOU-STRAIGHT BACK FOR FELLING AND BUCK SAWING



| Lengthfeet | 4 | 41/2 | 5 | 51/2 | 6 | 61 2 | 7 | 71/2 | 8 |
|-------------------------------------|------|------|------|------|------|------|------|------|-------|
| Price, 4 tauges Thinner on backeach | 3.20 | 3.75 | 4.55 | 5.30 | 6.20 | 7.10 | 8.15 | 9.20 | 10.35 |

TRIUMPH TOLEDO



Fig. 8592E

| Lengthfeet | 4 | 41/2 | 5 | 512 | 6 | 615 | 7 |
|--|------|------|------|------|------|------|------|
| Prices, 2 Gauges Thinner on Back, each | 2.20 | 2.48 | 2.75 | 3.02 | 3.30 | 3.58 | 3.85 |



KNIVES

FOR FURNITURE AND VENEER FACTORIES VENERE ENIVES

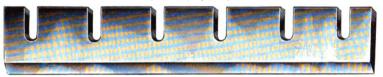


Fig. 7072A



Fig. 7072B

PLANER KNIFE

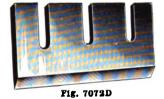


Fig. 7072C

BARKER KNIFE

STRAIGHT KNIFE

SHINGLE KNIFE



......

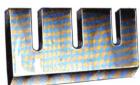


Fig. 7072E



Fig. 7072F



UNTEMPERED MOULDING BLANK





Fig. 7072J

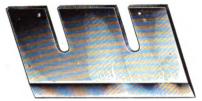


Fig. 7072G



Fig. 7072H

LOOP-SLOT PLANER KNIFE



Fig. 7072K

STAVE KNIFE



Fig. 7072L

LISTING OR STAVE JOINTING KNIFE



Fig. 7072M

PLANER AND MACHINE KNIVES

PRICE LIST

PRICE LIST OF PLANING AND BARKING MACHINE KNIVES, also wood chipper knives flat fur cutting bed knives, and ordinary straight knives of same finish (not otherwise provided for) %" thick or less.

| PRICE PER INCH, | From | Over | Over | Over | Over | Over | Over | Over |
|-------------------------|-----------|----------|---------------|------------------|------------------------|--------------|-----------|-----------------|
| | 61/4-31 | 31-40 | 4 0–50 | | 6 0- 7 0 | 70–80 | | 90 –100 |
| | long | 21 | 24 | 28 | 32 | 39 | 46 | 53 |
| 4" wide or less | | | | | | | | |
| Over 4 to 4½, | | | | | | | | |
| 4½ to 5, | Figu | re at ac | tual me | easureme | ent, viz: | 241/8, 50 | ⅓, etc. | Knives |
| 5 to 5⅓, | wider or | thicker | in one | part the | an anoth | er figu | re by w | idest or |
| 5½ to 6, | thickest | neasure | ment. | Measure | by longe | st lengt | h whet | her cut- |
| 6 to 6½, | ting edge | or back. | ALL K | NIVES lo | nger or w | ider tha | n in list | (unless |
| 6½ to 7, | otherwise | provide | ed for) f | igure Sp | ecial Lis | st. Kni | ves with | count. |
| 7 to 7½, | erbored a | lots add | l 10%. | Advance | for extr | a thickn | ess all l | nives as |
| 7½ to 8, | follows: | | | | | | | |
| 8 to 8½, | | | | | | | | |
| 8½ to 9, | Over ¾ t | o %6 thi | ck, add | 10%; | Over ¾ | to % th | ick, add | l 30 % ; |
| 9 to 91/4, | 7/16 | to 1/4 " | | 15%; | 7/8 | to 1" | " " | 35%; |
| 9½ to 10, | ⅓ t | o 5/8 ' | | 20%; | 1 (| o 1¼ | " " | 50≰; |
| 10 to $10\frac{1}{2}$, | 5% t | 34, " | • • | 25%; | | to 11/4, | " | 75≰; |
| 10½ to 11, | | | Over 13 | ≰ to 2" t | hick, add | 100%. | | |
| 11 to 11½, | | | | • | | | | |
| 11½ to 12, | | | | | | | | |
| Solid Steel Planer | Kniveg e | te over | 19# lone | onavha v | a 254 . 5 | of thick | or less | and 50¢ |

Solid Steel Planer Knives, etc., over 12° long advance 25%; $\%_{16}$ ° thick or less, and 50% thick or more.

STRAIGHT KNIVES

| 61/4 long or less (3/8" thick or less) 2 inches long or less, 4" wide or less |
|---|
| Over 2 to 4" long, 4 inches wide or less, |
| Over 4 to 6 1/8" long, 4" wide or less, |
| Over 4" wide, increase 1/6 for each inch or fractional part. |

Add 50% for knives plated all over one face. Advance for extra thickness. Counterbored slots, add 10%.

ALL FLAT KNIVES

(3%" thick or less) with irregular edges (not moulding knives), add 50% to list of straight knives 61%" long or less (except in lots of 50 or more without slots, as provided in Jointer and Sectional Matcher Bit List), and, to list of Planer Knives, if over 61%" long. (This covers knives not otherwise provided for with slightly convex, concave, angular or irregular edges that can be ground on ordinary grindstone.) Figure by widest part of knife. Advance for extra thickness. Counterbored slots, add 10%.



PLANER AND MACHINE KNIVES

MOULDING CUTTERS %" thick or less, with edge worked to pattern, 5" wide or less...... If over 5 inches wide, advance 1/4 for each inch or fractional parts. No Moulding Cutter will be charged for at a less price than 75 cents each. Advance for extra thickness MOULDING CUTTER BLANKS %" thick or less, 5" wide or less, 2 inches long or less,.... Over 2 to 3 inches long..... Over 3 to 4 inches long.... Over 4 to 5 inches long Over 5 to 6 inches long.... Prices same as Straight Knife 61% inches long or less, but less 10% if tempered, and less 25% if untempered. Advance 20% over 5 inches wide. Advance for extra thickness. PLATED STOCK IN BARS With edges faced or not.... When faced..... Plated all over one face.... For Back Lathe Knives.... BEVELED EDGE STEEL IN BARS For making upright Moulder or Shaper Bits up to 11/2 inch wide..... 1/2 inch or fractional part of 1/2 over 11/2 wide If plated Cope Cutters JOINTER SECTIONAL MATCHER BITS, SASH BITS, AND OTHER SMALL BITS WITHOUT SLOTS 3/8" thick or less; 5" wide or less. 1 inch long or less Over 1 to 2 inches long Over 2 to 2½ inches long Irregular Edge Cutters (without slots), in these sizes (except Sectional Matcher Bits), in lots of 50 or more Advance for extra thickness..... If over 5 inches wide, increase 1/6 for each inch or fractional part thereof. SOLID MILLED MATCHER BITS 2 inches long or less.... Over 2 inches long..... IRREGULAR KNIVES Not otherwise provided for; extra price to cover increased cost. **GAINING CUTTERS** Over 2 to 3 inches

"

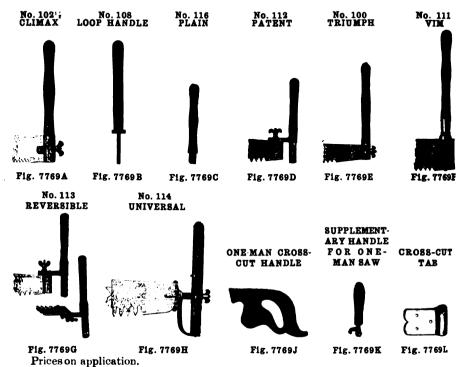
Over 3 to 4 inches



.......

DISSTON SAW HANDLES AND FILES

CROSS-CUT SAW HANDLES



IMPROVED SAW FILES



Fig. 7769M

No. 1, or large size for saws 40 inches diameter and larger. No. 2, or medium size for saws 38 to 24 inches diameter. No. 3, or small size for saws 24 inches diameter and smaller.

This side file is used for the purpose of regulating saw teeth after they have been set.

It is impossible to set a saw so that some teeth will not extend or be bent a little more than others, and thus causing

rough timber.

By the use of this tool all the teeth are made of a uniform width, and a saw thus regulated will run twice as long without sharpening. The file may be so adjusted by means of the set-screw, as to conform to any width of set desired. The jam nuts secure the set-screws in the desired position.

| Price | for Side File | each | 30 75 |
|-------|---------------|------------|----------|
| 66 | " Frame | . " | . 75 |
| " | Complete | . " | 1.05 |



SAW TOOLS

CRESCENT AND IMPROVED





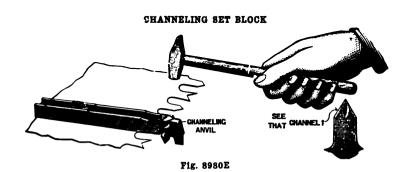
No. 5





Fig. 8980C

Fig. 8980D



| Price, | Crescent, | without Hammerp | er dozen | 9.00 |
|--------|-----------|---------------------------|----------|--------------|
| ** | " | Drop Forged Steel Hammers | " | 4.80 9.00 |
| " | | Tools | " | 9.00 |

SAW SETS

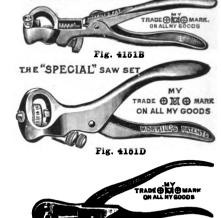












MORRILL'S NO.5. SAWSET

Fig. 4151F

MORRILL'S NO.I. SAWSET

MORRILL'S SAW SETS

| No. 1, Old Style, For Hand, Band and Ji | er dozen 10.00 |
|--|------------------|
| " 1, Improved, " " Saws, from the " 95. | " 15.00 |
| "95, " " " " " " " " " " " " " " " " " " " | " 15.60 |
| Special " " " " " | " 16.25 |
| No. 3, For Cross Cut and Circular Saws | " 20.60 |
| "4, " " Champion To | " 20.60 |
| " 5, " Timber and Board Saws, from | " 30.00 |

STEARNS' SAW SETS-Morrill Pattern

| No. 100, For Hand, Band and Jig Saws, from the widest down to ½ in. per dozen | 12.00 |
|---|-------|
| " 104. " Cross Cut and Champion Tooth Saws, 14-20 gauge" | 24.00 |



Fig. 4151G

AIKENS' SAW SETS

| No. 5 Aiken Pattern, Cast Steel per dozen No. 1 Genuine Aiken, Best Cast Steel " 14.70 |
|--|
|--|



. .

DISSTON SAW GUMMERS AND SWAGES

THE VICTOR SELF-FEEDING SAW GUMMERS

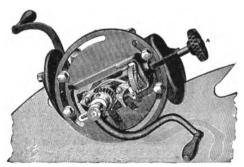


Fig. 2596A

Price, complete with one cutter shaft, cutter grinder and 3 cutters..... each 18.00

We carry three sizes of cutter shafts for this gummer. The No. 1 or large shaft is the same diameter as is used in our No. 1 gummer and is suitable for cutters 1, $1\frac{1}{8}$, $1\frac{1}{4}$, and $1\frac{1}{2}$ inch. The No. 2 or medium shaft is suitable for cutters $\frac{1}{2}$, $\frac{5}{8}$, $\frac{3}{4}$ and $\frac{7}{8}$ inch. The No. 3 or small shaft is made specially for $\frac{3}{6}$ -inch cutters.

In ordering gummers, state size of cutters wanted. Extra shafts can be furnished with the gummers at 2.00 each, so that all above sizes can be used in one machine if so desired.

GUMMER CUTTERS

| Sizeinches | 3/8 | 1/2 | 5/8 | 34 | <i>7</i> ⁄8 | 1 | 11/8 | 11/4 | 13/8 | 11/2 |
|------------|-----|-----|-----|-----|-------------|-----|------|------|------|------|
| Priceeach | .23 | .23 | .23 | .27 | .32 | .37 | .40 | .45 | .50 | .55 |

Cutters for No. 2 Gummer have a $\frac{1}{16}$ inch hole. Cutters for No. 1 Gummer have a $\frac{1}{16}$ inch hole. The 1 to $1\frac{1}{12}$ inch cutters are for the No. 1 Gummer and the $\frac{1}{12}$ to $\frac{1}{16}$ inch for the No. 2 Gummer.

CONQUEROR SAW SWAGES OR UPSETS

No. 2



Fig. 2596B

No. 8



Fig. 2596C

| No. | 00 | for | large | Saws | each | 3.50 |
|-----|----|-----|-------|------|------|------|
| • • | 0 | 66 | " | " | " | 3.00 |
| | 1 | " | " | " | 66 | 2.75 |
| | 2 | " | small | " | " | 2.25 |
| | 3 | 46 | 44 | 66 | 66 | 1.75 |
| | 4 | 66 | Band | " | " | 2.25 |

KNIFE BALANCING MACHINES

MARGEDANT



Fig. 7755A

Price.....each | 15.00

Planer knives must have accurate balance — both against the other and endwise — to produce good results. The above cut represents a perfect machine for balancing knives.

Be sure the knives are the same thickness from end to end.

Turn the knife end from end, and note the difference; file or emery off the heavy end on a bevel, the same as the back shows, leaving cutting edge full length, or file out in the slots. If there be too great a difference in the balance, it will be better to drill out in the heavy end, and in the center (from edge to back) of the knife until the two ends balance.

It is equally important that all knives used on side heads should be kept in perfect balance. The cylinder bolts may also be balanced on this scale. Bolts and washers on a cylinder should all be equal in weight.

DEFIANCE PROPORTIONAL



Fig. 7755B

| Number | 1 | 2 |
|----------------------------|----------|----------|
| For Knivesinches Priceeach | up to 36 | up to 48 |

The knives could be reduced to the same specific weight by the aid of a common Grocers' scales, but that would not attain the object: By the use of the Proportional Balancing Machine, the position as well as the amount of excess of weight can be ascertained, so that in reducing the knives to the same specific weight, they may be made to agree in their corresponding parts.

The method hitherto used is by reducing pairs or sets of knives to the same dimensions, and, by aid of common scales, to the same specific weight; but so great are the differences in the density of the parts of even the same knife, that a still running set of

knives is but an accidental result.

HANCHETT SAW SWAGES

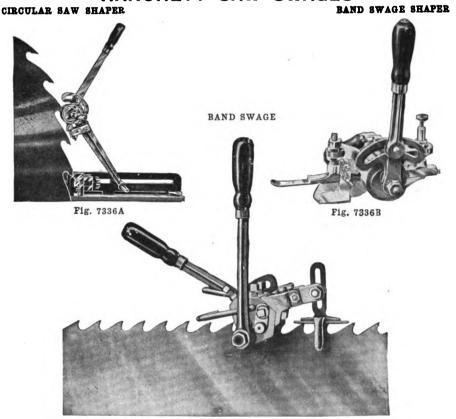


Fig. 7336C

CIRCULAR SWAGE SHAPERS For Log, Shingle, and Small Circular Saws

| Number | 1 | 2 | 3 |
|--------------------------------|---------|-------------------|------------------|
| For Sawsgauge number Priceeach | 5 to 13 | 12 to 18 20.00 | 16 % 22 20.00 |

BAND SWAGE SHAPERS For Band, Band Resaw, and Gang Saws

| Number. | 1 | 2 | 3 |
|-----------------------------------|----------|----------|----------|
| For Saws. gauge number Price each | 10 to 13 | 12 to 18 | 16 to 29 |
| Price each | 25.00 | 20.00 | 20.00 |

BAND SWAGES FOR BAND OR GANG SAWS

| Number gauge number | 0 8 to 13 | 1 12 to 16 | 16 to 18 | 18 to 9c |
|---------------------|--------------|---------------|----------|----------|
| Priceeach | 35.00 | 33.00 | 28.00 | 28.00 |

HANCHETT SAW SWAGES

STYLE A
CIRCULAR SAW SWAGE



Fig. 1338A

STYLE C SWAGE WITH BENCH CASTING ONLY



Fig. 1338B

SWAGES WITHOUT BENCH CASTING OR JOINTER

Style A represents our Swage for circular saws without the Bench Casting or Jointer, and is designed especially for those who do not wish to pay the few extra dollars for the Bench Casting and Jointer.

It is always best when ordering a swage to send with the order a sketch or paper pattern of the saw showing the size and shape of the teeth and gauge of the saw upon which the swage is to be used, that we may adjust the swage for the particular saw before it leaves the factory.

The Hanchett Swages are all sold with unqualified guarantee, and we are always glad to send them out to responsible parties on trial.

| Number | 1 | 0 | 2 |
|--|---------|---------|----------|
| For Sawsgauge number Price, without Bench Casting or Jointereach | 5 to 10 | 8 to 12 | 11 to 16 |
| | 35.00 | 35.00 | 33.00 |

SWAGES WITH BENCH CASTING ONLY

Factory and shingle mill men and all users of small circular and band resaws are realizing more than ever the great benefits derived by using on their saws a good swage instead of the old way of using spring set or the upset. We know this to be so from the fact that we are selling a great many swages for this purpose.

Style C represents our Swage for Circular Saws with Bench Casting, as shown in above cut, but does not include the Jointer.

| Number | 1 | 0 | 2 | 3 | 4 |
|---|---------|---------|----------|----------|----------|
| For Sawsgauge number Price, with Bench Casting onlyeach | 5 to 10 | 8 to 12 | 11 to 16 | 16 to 18 | 19 to 22 |
| | 38.00 | 38.00 | 35.00 | 30.00 | 30.00 |

WHITE SAW SWAGES NEW STYLE

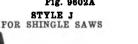
STYLE B2 FOR RESAWS



STYLE I FOR SHINGLE SAW



Pig. 9602A STYLE J



Pig. 9602B

STYLE B2

Priceeach | 30.00 The upper left hand cut represents our

latest style improved swage for resaws. The block is $2\frac{1}{2}$ inches in diameter and the die is 76 of an inch in diameter and 4 inches long and is suitable for swaging saws 16 to 20 gauge in thickness with teeth spaced 34 of an inch from point to point or wider.



Fig. 9602C

STYLE !

Priceeach | 35.00

The Style I machine has all the improvements contained in Style F. It is adjusted and operated in the same manner and can do the same class of work, but is a lighter

The block is 3 inches in diameter and the die is % of an inch in diameter.

Above cut shows the method of swaging shingle saws, but small round saws of any kind may be swaged in the same manner.

STYLE J

Priceeach | 35.00

In the above cut is shown the Style J shingle saw swage. This machine has all of the main features and adjustments of other improved White swages, the block being 3 inches in diameter and the die % inches in diameter.
Used in connection with filing bench.

The White swage has now been on the market for more than 14 years and thousands

have been sold in all parts of the world. Hundreds of letters which the makers have on file praising these machines in the most glowing terms prove beyond a doubt that they have met with the greatest success and are to-day the favorite with all up-to-date filers and mill men.

SAW SWAGE SHAPERS

ATKINS PRIBNOW "IMPROVED"

CHAMPION





'ig. 5222A Fig. 5222B ATKINS PRIBNOW "IMPROVED"

The Pribnow Improved Patent Swage Shaper, recently greatly improved in design and utility, has incorporated in its make-up the combined advantages of fifteen years' practical experience of its inventor and suggestions from many of the best filers in the country.

It is easy to operate and has few parts, the adjustment of which are very accurate and all are in plain sight of the operator. The shaper completes the work of the swage. It compresses the swaged point of the tooth, making it more durable and at the same time giving it that form which affords the most perfect clearance in the cut and insures smoother and better lumber and a saving in power. It does the most perfect work of any on the market.

| N 1 | | - | |
|-------------------------------|---------|----------|----------|
| Number | 4 | 1 0 | О |
| For Sawsgauge no. | 6 to 10 | 10 to 16 | *17 w 24 |
| For Saws gauge no. Price each | 25.00 | 25.00 | 25.00 |

^{*}No. 6 is for saws; No. 17 to 24 Gauge and Thinner.

CHAMPION

The working points of all Champion Swage Shapers are exactly alike in shape and action, the only difference being in size of parts and style of frame. These are changed to meet the requirements, give the machine proper strength and a suitable frame to accommodate the saws for which it is designed or on which it is to work.

| Styre | F No. 1 |
|---|---------------|
| For Light Band Sawsguage no. | 14 to 20 |
| Teeth Spaced from Point to Point inches | 11 / to 21/ |
| Diameter of Dies " | 11/4 |
| Anvil and Tooth Stop " | 3/6 |
| Die Lever | 71.5 |
| Diameter of Dies. " Anvil and Tooth Stop. " Die Lever. " Price, Complete with Open Wrench to fit all Screws. each | 2 5.00 |

This machine is intended for use on band saws only, it can be used on circular saws, and is furnished with special brackets for that purpose, when so ordered. Complete instructions for operating are sent with each machine.

SAWMAKERS' TOOLS



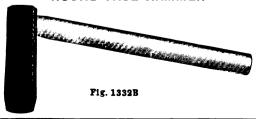
STEEL FACED ANVILS

Price, Anvils weighing less than 180 poundsper pound | 12 " 180 pounds or over........... .131/6

We keep in stock Anvils 10x6 face, 86, 110, 145 pounds; 12x6. 250 pounds.

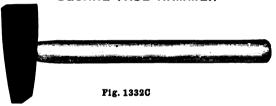
Fig. 1332A

ROUND FACE HAMMER



Furnished any weight desired.

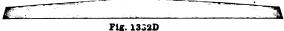
SQUARE FACE HAMMER



per pound

Furnished any weight desired.

STRAIGHT EDGE



| Lengthinches | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 | 28 | 30 | 36 |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Priceeach | .40 | .45 | .50 | .55 | .65 | .75 | .87 | .95 | 1.05 | 1.35 | 1.56 | 1.65 | 1.95 |
| Lengthinches | | | | | | | | | | | | | |
| Priceeach | 2.10 | 2.30 | 3.00 | 3.50 | 3.70 | 4.00 | 4.60 | 5.00 | 5.50 | 6.50 | 7.50 | 8.50 | 9.50 |

LEVELING TABLE



Fig. 1332E

Price, 12 inches wide, 7 feet long each | 12.00

SAWMAKERS' TOOLS

CIRCULAR AND MILL SAW SETS

Made to Suit Saws of Different Sizes



Fig. 7561A

| Price, Small, for Band Saws, Single Handle each | 1.00 |
|---|------|
| " Large, for Circular Saws, Double Handle " | 1.50 |

SWAGING HAMMERS AND BAR SWAGES



Fig. 7561B



Fig. 7561C

SWAGING HAMMERS

| Sizeinches | 3⁄4 | ₹8 | 1 |
|------------|------|------|------|
| Priceeach | 1.00 | 1.25 | 1.50 |

BAR SWAGES Eight or Six Sided

| Number | 1 | 2 | 3 | 4 |
|----------------------|---|--|---------------------|---------------------|
| Sizeinches Priceeach | | $\frac{11 \times 1\frac{1}{4} \times \frac{5}{8}}{3.00}$ | 11 x 1½ x ¾ 3.50 | 11 x 1¾ x ¾ 4.00 |

SILVER SOLDER







Fig. 7561E

The successful brazing of Band Saws largely depends on the solder used. We use and keep constantly in stock, special Silver Solder that has proved to be the best adapted for brazing tempered steel.

We will furnish Silver Solder at the lowest market price, predicated on the price of silver.

KNIGHT'S IDEAL SAW MILL DOGS







Pig. 7108B

| No. | Helght | Size of Guide | Size of Slide Bar | Size of Dog Bit | WEIGHT Pounds | | PRICE PER PAIR | |
|--------------------------|----------------------------|-----------------------------------|--|---|-------------------------------|--------------------------------|---|--|
| | Inches | Bar Inches | Inches | Inches | Single | Duplex | Single | Duplex |
| 1 2 3 3 Special | 38 41 45 49 51 | 3 x ½ 3½ x ½ 4 x 58 4 x 58 5 x 34 | 2 x 5/8 21/2 x 5/8 3 x 5/8 3 x 5/8 3 1/2 x 3/4 | 1½ x½ 2 x½ 2½ x½ 2½ x½ 2½ x½ 2½ x¾ | 60 95 115 135 175 | 80 110 125 150 235 | 25.00 30.00 35.00 60.00 85.00 | 45.00 50.00 55.00 85.00 125.00 |

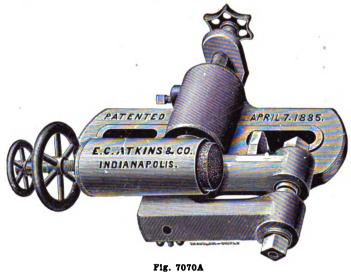
Machines illustrated are left hand.

Knight's Ideal Saw Mill Dogs are too well known among mill men to require a detail description of their operation. We wish, however, to call your attention to the improved locking mechanism on the Single Dog, an arrangement by which the dog bit is locked at any point as it is forced into the timber. This device is controlled by the power lever, and is entirely automatic.

Knight's Ideal Duplex Dog resembles in design the Single Dog, differing only in that it catches the log from above and below. The lower dog, which is located between the guide and slide bars, is entirely automatic in its action, no adjustment being necessary to bring it into proper position to hold either a log or cant. It is controlled by the power lever requiring no extra movement to operate. Can be handled with the same speed as the Single Dog, thus making it the best general purpose dog there is on the market.

10.00

SAW GUIDES ATKINS COMBINED CIRCULAR SAW GUIDE AND ROUNDER

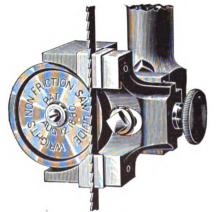


No. 1, FOR ORDINARY MILLS

| Price, Guide, without Roundereach " Combined Guide and Rounder" | 6.00 8.00 |
|---|--------------|
| No. 2, FOR HEAVY WORK | |
| Price, Guide, without Rounder each | 8.00 |

WRIGHT'S NON-FRICTION BAND SAW GUIDE

Combined Guide and Rounder



Pig. 7070B

CIRCULAR SAW MANDRELS

CAST STEEL
SELF-OILING BOXES
PULLEY INSIDE BOXES



Fig. 1350A

| Num- ber | Extreme Length Inches | Diameter of Arbor Inches | Diameter of Pulley Inches | Face of Pulley Inches | Diameter of Collars Inches | Size of Hole in Saw Inches | Size of Saw Inches | Price Each |
|-------------|-----------------------------|--------------------------------|---------------------------------|-----------------------------|----------------------------------|-------------------------------------|--------------------------|---------------|
| 1 | 14 | 1 16 | 3 | 3 | 3 | 1 | 6 to 12 | 7.50 |
| 2 | 16 | 116 | 3 | 31.2 | 3 | 1 | 14 " 18 | 8.00 |
| 3 | 18 | 15/6 | 3 | 4 | 31/2 | 11/8 | 20 " 24 | 9.00 |
| 4 | 20 | 13/6 | 31.2 | 41/2 | 312 | 11/8 | 26 " 28 | 10.00 |
| 5 | 22 | 15/6 | 4 | 5 - | 4 | 11/4 | 30 " 32 | 11.50 |
| 6 | 24 | 15/6 | 41/2 | 51/2 | 4 | 11/4 | 34 " 36 | 13.00 |
| 7 | 26 | 176 | 5 | ` 6 | 41/2 | 13/8 | 36 | 14.50 |
| 8 | 28 | 178 | $5\frac{1}{2}$ | 61/2 | 412 | 13% | 36 | 16.00 |
| 9 | 32 | 118 | 6 | 7 | 41/2 | 11/2 | 36 | 20.00 |
| 10 | 36 | 1 | 7 | 8 | 5 7 | $15\frac{7}{8}$ | 38 | 26.00 |

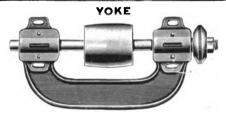


Fig. 1350B

| Num- ber | Extreme Length Inches | Diameter of Arbor Inches | Diameter of Pulley Inches | Face of Pulley Inches | Diameter of Collars Inches | Size of Hole in Saw Inches | Size of Saw Inches | Price Each |
|-------------|-----------------------------|--------------------------------|---------------------------------|-----------------------------|----------------------------------|-------------------------------------|-----------------------|-------------------------|
| 1 2 2 | 10 14 16 | 15/ 16 15/ 16 | 2½ 3 | 3 4 | 3 | 7/8 1/8 | 6 8 to 10 | 9.00 10.50 |
| 3 4 5 | 18 20 | 1 1/6 1 3/6 1 5/6 | $\frac{3\frac{1}{2}}{4}$ | 4½ 5 5½ | 31/2 | 11/8 11/4 | 16 " 18 20 " 24 | 12.00 14.00 16.00 |
| 6 7 | 22 24 | 17/6 19/6 | 5 6 | 6 7 | 4 41/2 | $\frac{13}{8}$ $\frac{11}{2}$ | 26 " 28 30 " 36 | $18.00 \\ 20.00$ |

Larger Sizes Made to Order
We fill all orders for mandrels with pulley outside of boxes, unless otherwise ordered.
Price does not include saw.

When ordering saw mandrels, send sketch and give distance from saw to end of mandrel if the pulley is between the bearings. If the pulley is on the end of mandrel, give distance from saw to inside edge of pulley. Also, whether the pulley is on the right or left-hand side of mandrel when the saw is running towards you.

Our mandrels are made with pulley on right-hand side, with left-hand thread, unless otherwise ordered.

CIRCULAR SAW MANDRELS

SELF-OILING BOXES

PULLEY OUTSIDE BOXES



Pig. 1851A

| No. | Extreme Length Inches | Diameter of Arbor Inches | Diameter of Pulley Inches | Face of Pulley Inches | Diameter of Collars Inches | Size of Hole in Saw Inches | Size of Saw Inches | Price Each |
|--------------------------------|---|--|--|--|--|---|--|--|
| 1 2 3 4 5 6 | 16½ 19 21½ 24 26 28 30½ | 1 16 1 16 1 36 1 36 1 56 1 56 1 76 | 3 3 3 3 ¹ / ₂ 4 4 ¹ / ₂ | 3 3½ 4 4½ 5 5½ 6 | 3 3 31/2 31/2 4 4 41/2 | 1 1 1/8 1/8 1/4 1/4 1/4 | 6 to 12 14 " 18 20 " 24 26 " 28 30 " 32 34 " 36 | 8.00 8.50 9.50 10.75 12.50 14.00 16.00 |
| 8 9 10 11 12 13 | 33½ 37 41 44½ 48 54 | 1.7% 1.9% 1.1% 1.1% 1.1% 1.1% 2.3% | 51/2 6 7 8 10 12 | 6 ¹ ½ 7 8 10 10 | 41/2 41/2 5 5 5 5 | 138 115 158 158 158 2 | 36 38 40 40 42 42 | 18.00 22.50 28.00 33.50 40.00 50.00 |

CONNECTED BOXES



Pig. 1351B

| Number | Extreme Length Inches | i | Distance from Center to Center of Bolt Holes Inches | | Diameter of Pulley Inches | race | Diameter of Collars Inches | Hole in Saw Inches | Size of Saw Inches | Price Each |
|--------|-----------------------------|-----------------|---|--------------------|---------------------------------|----------------|-------------------------------------|-----------------------------|--------------------------|---------------|
| 1 | 231/2 | 17 | 133/4 | 15 | 3 | 4 | 3 | 78 | 4 to 10 | 9.00 |
| 2 | 261/2 | 19 | 141/2 | 1 16 | 31/2 | 41/2 | 3 | 1 | 12 " 14 | 11.00 |
| 3 | 283/4 | $20\frac{1}{2}$ | 1534 | 1 16 | 4 | 5 | 31/2 | 11/8 | 16 " 18 | 13.25 |
| 4 | 301/2 | 22 | 161/2 | 1 5 | 41/2 | $5\frac{1}{2}$ | 31/2 | | | 15.50 |
| 5 | 331/2 | 24 | 19 | 1_{16}^{7} | 5 | 6 | 4 | 13 8 | 26" 2 8 | 17.75 |
| 6 | 361/2 | 26 | 2034 | $1^{\frac{9}{16}}$ | 6 | 7 | 41/2 | 11/2 | 30 | 20.00 |

Larger Sizes Made to Order

We fill all orders for mandrels with pulley outside of boxes, unless otherwise ordered. Price does not include saw.

When ordering saw mandrels, send sketch and give distance from saw to end of mandrel if the pulley is between the bearings. If the pulley is on the end of mandrel, give distance from saw to inside edge of pulley. Also, whether the pulley is on the right or left-hand side of mandrel when the saw is running towards you.

Our mandrels are made with pulley on right-hand side, with left-hand thread, unless otherwise ordered.

SAW GUMMERS AND SHARPENERS

COVEL
CIRCULAR HAND SAW
GUMMER



Fig. 7067A

ATKINS
"PERFECTION" GUMMER
AND SAW SHARPENER



Fig. 7067B

COVEL CIRCULAR HAND SAW GUMMERS

| Price for saws 8 to 40 inches, made right hand only each " " 14 to 72 " " and left hand" | 45.00 |
|--|------------------|
| Pulleys on Countershaft inches | $6x2\frac{1}{6}$ |
| Speed per minute revolutions | 1500 |
| Emery Wheel on small machineinches | 10 |
| " " " large "" | 12 |

Made both right and left hand. Will sharpen either cross-cut or rip saws. The saw is raised and lowered by a screw.

ATKINS "PERFECTION" GUMMER AND SAW SHARPENER Made for all Sizes of Circular Saws

| Price, including Mandrel Belt and Emery Wheel each 3 |
|--|
|--|

No. 35

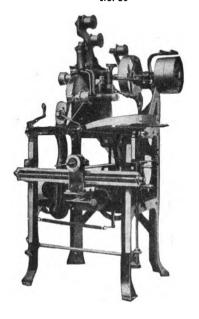


Fig. 1323A

No. 55

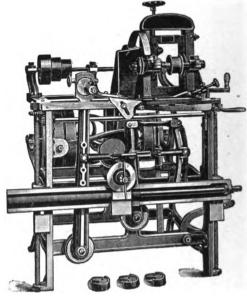


Fig. 1323B

No. 35

Price, Weight 750 pounds.....each 165.00

No. 35 is an automatic circular sharpener for cross-cut and rip saws from 8 to 44 inches in diameter. Will sharpen square or bevel as desired. Machine is furnished with a special cross-head for sharpening edger saws without removing them from the collars, if so ordered. Price, 15.00 extra.

This machine is also built in a smaller size, called the No. 40, which will take saws from 6 to 22 inches; also built in a larger size, called the No. 95, which will take

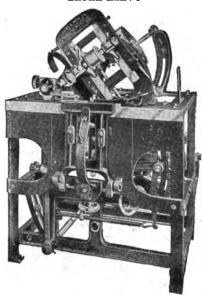
saws from 16 to 72 inches.

No. 55

Price, Weight 850 pounds.....each | 175.00

No. 55 is an improved automatic sharpener for circular rip-saws from 12 to 72 inches. This is the most complete Circular Saw Sharpener ever made, and the only one that will sharpen all kinds of inserted tooth saws complete, without removing the points.





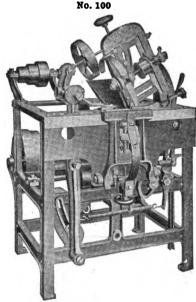


Fig. 1322A

Fig. 1322B

No. 90-EXTRA HEAVY

Cut shows right hand machine.

Suitable for large bands from 8 to 18 inches in width. This machine was designed to meet the demand for an extra heavy and durable automatic sharpener for large bands. Built on the same lines as the No. 100 machine.

Machine is furnished complete with independent back feed and four single and one double post bracket.

| Price, 8 to 16 inch Single Cut Saws, weight 1500 pounds eac | h 275.00 |
|--|----------|
| " 8 " 16 " " " without Post Brackets but with 1-set No. 12, 4 foot Extra Heavy Pulley Stands " | 325.00 |

No. 100

Cut shows right hand machine.

Latest improved Automatic Band Sharpener for single or double cut band saws from 6 to 14 inches in width. Machine is complete with independent back feed and five post brackets. In ordering give hand of mill and state if saw is to go in front or straddle sharpener.

| === | | | | |
|--------|------|---|------|--------|
| Price. | with | Back Feed and Post Brackets | each | 225.00 |
| 1, | *** | Dellare and Chandre and Deals Mandre Developed | | 075.00 |
| | | runeys and Stands, no back reed or brackets | | 275.00 |
| 66 | 66 | Pulleys and Stands, no Back Feed or Brackets Extra Post Brackets and Double Back Feeds | 44 | 240.00 |
| | | Extra 2 on Britishers and Bourse Duck 2 (100) | 1 | 210.00 |

AUTOMATIC SHARPENERS

BAND RESAW SHOWING RIGHT HAND MACHINE

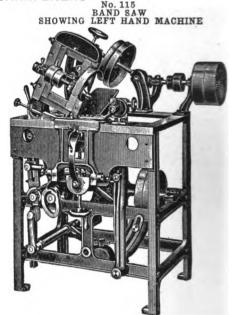


Fig. 1299A

No. 66

Fig. 1299B

| Description | Machine Only | With Pulleys and Stands |
|--------------------------|-----------------|----------------------------|
| Weight pounds Price each | 300 75.00 | 450 85.00 |

Furnished with electric motor. Price on application. Emery wheel and belt, 3.00 extra. The Seek Arbor Attachment will be attached to this machine and shipped on approval, subject to return if not entirely satisfactory after a fair trial; 15.00 extra.

All the adjustments to making the modern round-throat saw tooth or straight face and straight back tooth. Furnished with or without wood pulleys 30-inch diameter and stands. Two speeds to feed mechanism. Tight and loose pulleys on countershaft, 5½ inches diameter, 1½-inch belt. Speed 650 revolutions per minute. Emery wheel 8 inches diameter, 5%-inch hole. Thickness to suit size of teeth.

No. 115

| Price, with Post Brackets | each | 150.00 |
|--|------|--------|
| " " Pulleys and Stands and without Pos | | |

Suitable for small log bands or large band resaws from 4 to 10 inches in width.

Machine is complete with independent back feed and two single and one double post bracket.

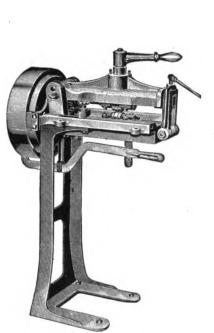
Specially adaptable to resaws and small log band saws. This machine is practically of the same construction as our large sharpeners, excepting that it has a smaller capacity. It is not to be compared with the cheaper resaw sharpeners that have to be mounted on a platform or bench.

It stands on its own foundation and is furnished with back feed and post brackets. In fact, it is our No. 100 machine in everything, excepting capacity and weight. We solicit an opportunity to send one of these machines on trial where other resaw sharpeners are in use.

BAND RESAW STRETCHERS

No. 78 RESAW STRETCHER

No. 82 BAND SAW STRETCHER OR ROLLER



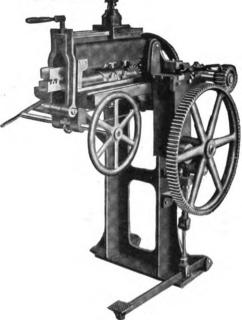


Fig. 7281A

Fig. 7281B

No. 78

| For Sawsinches | 2 to 8 | 2 to 10 |
|--|-----------|-----------|
| Size of Drive Pulleysinches | 15 x 41/2 | 15 x 41/2 |
| Speed of Pulleys revolutions per minute | 75 to 100 | 75 to 100 |
| Approximate Shipping Weight, without Legs pounds | | 330 |
| " " with " " | 375 | 400 |
| Price, without Legseach | 90.00 | 100.00 |
| " with " " | 100.00 | 110.00 |

No. 82

| For Sawsinches | Up to 14 |
|---|------------------|
| Size of Pulleysinches | 12½ x 4 |
| Speed of Pulleys revolutions per minute | 75 |
| Approximate Shipping Weight, without Retootherpounds | 750 |
| Approximate Shipping Weight, without Retootherpounds with " " " | 900 |
| Price, without Retoother each " with " " | 200.00 240.00 |

CLAMPS

No. 31. FOR BAND RESAWS

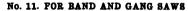






Fig. 1326A

Fig. 1326B

| Price, No. 31 with Legs, as Shown Weight 160 pounds | .each | 30.00 |
|---|-------|-------|
| " " 31 without Legs, Weight 115 pounds | . " | 20.00 |
| " " 11, Weight 300 pounds | . " | 50.00 |

No. 110. AUTOMATIC EMERY WHEEL BAND SAW SCARFING MACHINE

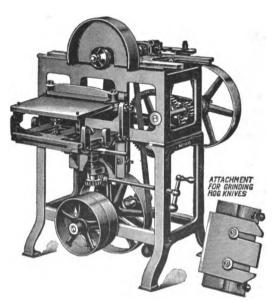


Fig. 1326C

| | | | | _ | | |
|--------|-----|------|------|----|-------|----------------------------|
| Price, | 12- | inch | Saws | or | less. | 135.00 |
| " | 14 | 46 | •• | 46 | ". | 145.00 |
| 46 | 16 | " | • • | " | ". | 135.00 145.00 175.00 |

Attachment for grinding hog knives, extra.

| Price for 12-inch Machine | |
|---------------------------|-------|
| " " 14 " " | 15.00 |
| " " 14 " " | 18.00 |

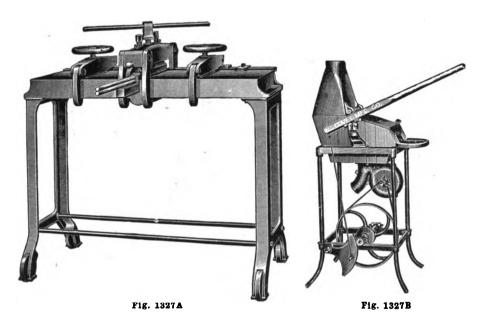
We can furnish this machine in a smaller size known as No. 102.

| Price, | Saws | as v | vide | as 8 in | 95.00 100.00 |
|--------|------|------|------|---------|-----------------|
| " | 64 | " | 66 | 10 in | . 100.00 |

Movement of emery wheel is automatic, both lengthwise and sidewise. The table on which the saw rests is mounted on slides permitting the saw to be drawn back from the grinding wheel so that the operator can inspect the lap and then throw back into its work again without changing the bevel. This is the only practical automatic lap grinder manufactured.

No. 101 BRAZING TABLE

BRAZING PORGE



No. 101 BRAZING TABLES

| Size, Sawsinches | 12 | 14 | 16 | 20 |
|--|------------|------------|------------|-------------|
| Weight with Legspounds | 350 250 | 460 350 | 660 550 | 1100 950 |
| " without Legs " Price, with Legs each | 58.00 | 68.00 | 85.00 | 125.00 |
| " without Legs " | 50.00 | 60.00 | 75.00 | 110.00 |

The No. 101 Brazing Table. Bed full width of saw blade. Top arm of cast steel and extra heavy, clamps the saw from back to front edge.

Made in three sizes, with or without legs.

BRAZING FORGES

| | | | | | | | | | | |
|-----------|--------|-------|------|------|---|------|--------|------|------|---------|
| Price, wi | th 14. | inch | Fire | Box | Weight | 300 | nounds | | each | 40.00 |
| Title, wi | | ***** | 1110 | DUA, | *** *********************************** | 1700 | pounds | | | 20.00 |
| | 90 | 44 | 44 | 4.6 | 44 | 275 | - " | | 44 | 50.00 |
| | 20 | | | | | 010 | | | | 1 00.00 |
| | | | | | | | | | | |

This style of forge is built as a hand forge, or with both hand and power attachments, as shown. The power attachment is arranged with tight and loose pulleys.

Completely enclosed with a cast iron hood. Front part of the hood is hinged and can be raised to build the fire, etc. This hood is also corked tight with asbestos, which makes it the safest forge manufactured. It is so constructed that the heat is confined and not thrown out as in the ordinary tin hood forges which are offered in competition to it. The fire box has special tuyere irons of extreme length and will heat the brazing irons the entire length to a uniform color.

NO. 29. BRAZING CLAMPS
8 AND 10-INCH - FOR SMALL LOG BAND SAWS
AND BAND RESAWS



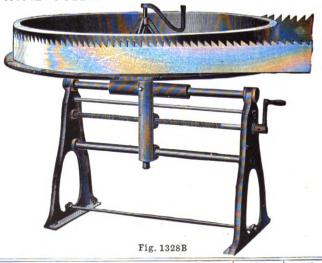
Fig. 1328A

| Pric | ce, | 6- | inch, | weight | 90 | pound | seach | 15.00 |
|------|-----|----|-------|--------|-----|-------|-------|-------|
| 66 | | 8 | 44 | " | 110 | | | 20.00 |
| 66 | 1 | 0 | " | " | 150 | | | 30.00 |

Strong and durable. Bed of table full width of saw. Clamps the saw at the braze with a three-section bar, and the pressure can be put on heaviest at any point. Side clamps are long flat steel pieces and are operated by a hand wheel.

The 6-inch for hand resaws are made on the same principle as the 8 and 10-inch clamps. Only the clamping screws for holding saws are adjustable in and out to any width of saw below 6 inches.

No. 12-PULLEY AND STAND FOR BAND SAWS



| Size of Pulleys inches | 60 | 48 | 36 |
|-----------------------------------|-------|-------|-------|
| Weight, Regular Patternpounds | 500 | 450 | |
| " Extra Heavy. " Light Pattern. " | 750 | 650 | 300 |
| Price, Regular Patterneach | 65.00 | 50.00 | |
| " Extra Heavy " | 90.00 | 75.00 | |
| " Light Pattern " | | | 40.00 |

This illustration shows one of the pulleys, which is adjustable horizontally with screw. Both pulleys are adjustable up and down.

SAW FILERS' TOOLS

THE AMBLER BAND SAW FILING AND SETTING APPARATUS



Fig. 2600A

| Price | Complete | each | 30.00 |
|-------|------------------------|------|-------|
| 44 | Filing Vise and Wheels | 44 | 18.00 |
| 66 | Setting Vise only | ** | 12.00 |
| 44 | Filing Vise only | 66 | 9.00 |

AUTOMATIC BAND SAW SETS

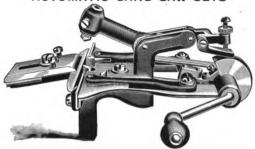
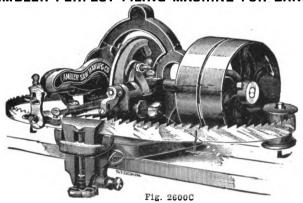


Fig. 2600B

Price. Complete each 6.00

This is one of the most practical and complete tools for the purpose ever invented; with it a boy can set perfectly a saw in about five minutes, and will set all sizes from 16 to 2 inches in width and any size teeth. Full instructions and directions are enclosed with each machine.

THE AMBLER PERFECT FILING MACHINE FOR BAND SAWS



| | | * | |
|---------------|-------------|---------------|-------|
| Price | | each | 35.00 |
| " Extra Files | | per dozen | 2.40 |

WHAT IT WILL DO

It will file your saws without your attention. It will save you 50 per cent in the cost of files. It will file saws sharper than by hand.

It will encourage your men to keep them sharp. It will thus save your saws from breakage. It will pay for itself in a few months.

Each machine is furnished complete with one-half dozen files

IMPROVED BUFFALO KNIFE GRINDERS

AUTOMATIC WITH WATER ATTACHMENTS-SPRING CROSS FEED

TYPE "A"





Fig. 2613A



Fig. 26133

TYPE "A"

| Grinds Knives up toinches | 26 | 32 | 38 | 44 | 54 |
|--------------------------------------|-------|--------------|--------------|---------------|---------------|
| Approximate Weight pounds Price each | 575 | 600 95.00 | 625 100.00 | 650 110.00 | 700 125.00 |
| Thee | 00.00 | 00.00 | 100.00 | 110.00 | 120.00 |

If without Water Attachments, deduct 10.00 from above prices. Tight and Loose Pulleys, 6 inches Diameter, 1100 revolutions per minute.

Cup Emery Wheel: Diameter, 8 inches; Face, 31/2 inches; Hole, 11/2 inches.

TYPE "C"

| Grinds Knives up toinches | | | 76 | 84 | 96 | | 120 |
|------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Approximate Weightpounds Priceeach | 1600 200.00 | 1800 210.00 | 1900 220.00 | 2000 230.00 | 2100 250.00 | 2300 265.00 | 2500 315.00 |

If without Water Attachments, deduct 15.00 from above prices. Tight and Loose Pulleys, 8 inches Diameter, 700 revolutions per minute.

Cup Emery Wheel: Diameter, 12 inches; Face, 4 inches; Hole, 2 inches.

TYPE "D"

| Grinds Knives up toinches | 26 | 32 | 38 | 44 | 54 | 60 | 72 |
|---------------------------|--------|--------|--------|--------|--------|--------|--------|
| Approximate Weightpounds | 850 | 900 | 950 | 1000 | 1100 | 1200 | 1300 |
| Priceeach | 132.00 | 142.00 | 152.00 | 162.00 | 172.00 | 182.00 | 192.00 |

If without Water Attachments, deduct 12.00 from above prices. Tight and Loose Pulleys, 7 inches diameter, 900 revolutions per minute.

Cup Emery Wheel: diameter, 10 inches; face, 3½ inches; hole, 1½ inches.

All these machines will grind either straight or concave bevel. Machines will be arranged to suit any knife without extra charge. When ordering, send description of knives to be ground.



AUTOMATIC PLANER KNIFE GRINDERS

FLAT WHEEL

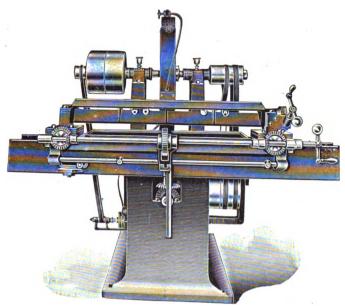


Fig. 3489A

| Size of Machine inches | 30 | 36 | 42 | 48 | 52 |
|---|---------|---------|--------|----------------|-------------------|
| Size of Wheelinches | 26x11/2 | 26x11/2 | 26x112 | 26x11/2 | 26x136 |
| " "Base" | 24x30 | 24 x 30 | 24x30 | 24 x 30 | 24x30 |
| Height to Center of Arbor " | 42 | 42 | 42 | 42 | 42 |
| Length of Bearings " | 7 | 7 | 7 | 7 | 7 |
| Diameter of Arbor through Bearings " | 1% | 1% | 1% | 1% | 196 |
| Size of Hole in Wheel | 21/2 | 21/2 | 21/2 | $2\frac{1}{2}$ | 21_{2}^{1} |
| " " Tight and Loose Pulleys " | 10x4 | 10x4 | 10x4 | 10x4 | $10\mathbf{x}4$ |
| Speed of Wheel per minuterevolutions | 600 | 600 | 600 | 600 | 600 |
| " Carriage per minute feet | 30 | 30 | 30 | 30 | 30 |
| Automatic Feed of Knife up to Wheel inches | 1/2200 | 1/2200 | 1/2200 | 1/2200 | $\frac{1}{2}$ 200 |
| Weightpounds | 1200 | 1400 | 1600 | 1800 | 2000 |
| Price without Automatic Feed of Knife up to | 1200 | | | 1 | 7000 |
| Wheel, and without Hood and Pumpeach | 250.00 | 275.00 | 370.00 | 420.00 | 470.00 |
| Price with Automatic Feed to Wheel " | 275.00 | 300.00 | 395.00 | 445.00 | 495.00 |
| " Water Hood and Pump " | 290.00 | 315.00 | 1 | | 570.00 |
| " Complete with Automatic Feed to Wheel | 200.00 | | 1 | | 510.00 |
| and Water Hood and Pumpeach | 315.00 | 340.00 | 435.00 | 485.00 | 535.0 |

Emery Wheels are included in above prices.



SAW-MILL MACHINERY

IMPROVED 8-FOOT BAND MILL

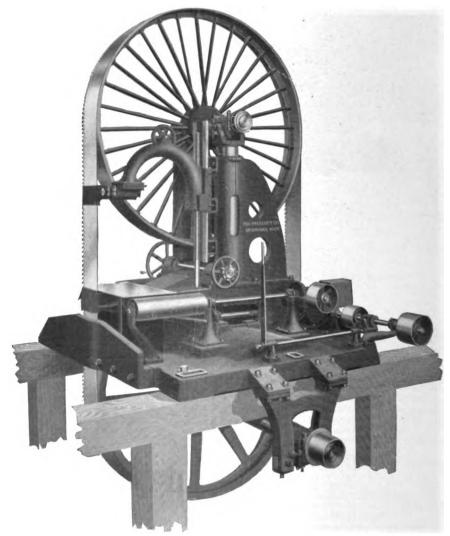


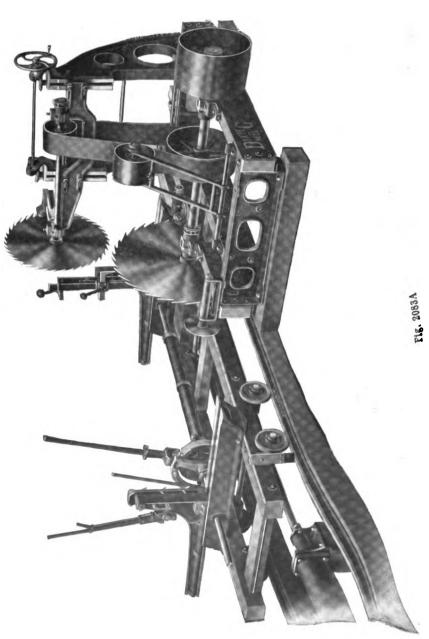
Fig. 2081A

Prices on application.

Prices on application

SAW-MILL MACHINERY

COMPLETE DIXIE C MILL WITH PLAIN TOP RIG, TOP GUIDE AND STEAM FEED CARRIAGE WITH PERFECTION BLOCKS



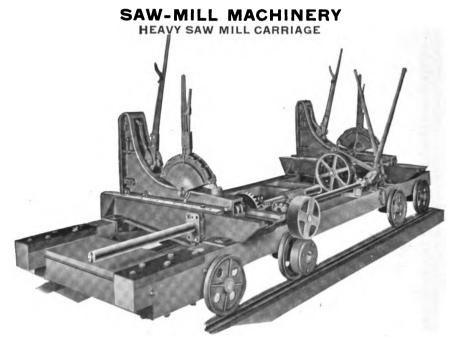




Fig. 2082B Prices and specifications on application.

LANE SAW MILLS No. 1

RIGHT HAND, IRON FRAME

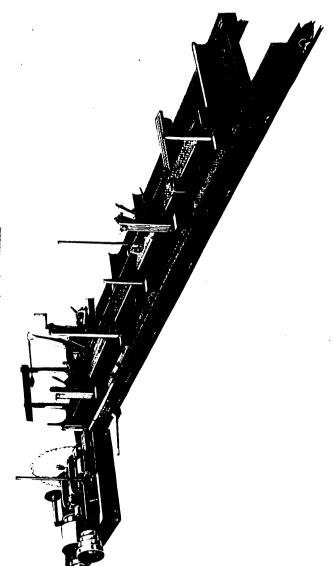


Fig. 9544A

Prices and further information on application.

AMERICAN SAW MILLS

WITH VARIABLE FRICTION FEED

No. 2

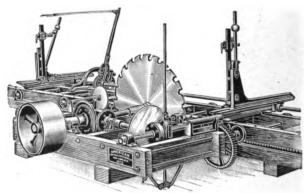


Fig. 6785A

Longer carriage, more head blocks and longer mandrels can be furnished if desired, at additional cost. Steel bases can be furnished for head blocks, at small additional cost. Double acting set works with spring or friction power receder furnished when ordered at additional cost. Ideal set works with quick recorder is furnished unless otherwise ordered. Rack and Pinion drive furnished unless otherwise specified, but Manila Rope drive or Wire Cable drive will be substituted, if preferred, at small additional cost.

BELT FEED SAW MILLS

Nos. 1 to 7

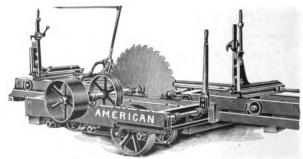


Fig. 6785B

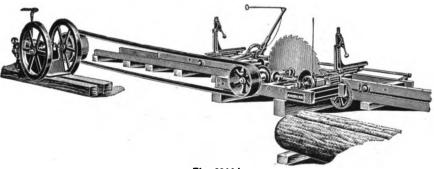
Made in same sizes as Variable Friction Feed Mills. Nos. 1 to 4 being belt feed and Nos. 6 and 7 hercules feed. Any mill equipped with this feed except No. 1.

Feed and friction pulleys for No. 2 mill are 4 inch face, No. 3, 5-inch face, No. 4. 6-inch face. General specifications of belt feed mills are same as those of standard mills except that frames are longer to provide space for feed pulleys. All belt feeds are equipped with wire rope carriage drive unless otherwise ordered.

Foundation bolts, cant hooks, oil can and wrenches furnished with each mill.

AMERICAN SAW MILLS AND SAWDUST CONVEYORS

No. 1. WITH GASOLINE ENGINE



Pig. 6844A

Prices quoted on receipt of specifications. Nos. 2 and 3 mills can also be operated with gasoline engines.

SAWDUST CONVEYOR

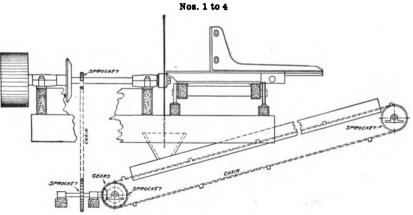


Fig. 6844B

| Number | 1 | 2 | 3 | 4 |
|---|-------|-------|-------|-------|
| Longest Run feet Weight pounds Price of 25-Foot Conveyor each " "Extension per foot | 40 | 60 | 80 | 150 |
| | 135 | 150 | 175 | 250 |
| | 30.00 | 35.00 | 45.00 | 70.00 |

Standard chain driven. Split sprockets for mandrels furnished when ordered.

Carrier can be driven in either direction for conveying through trough as above, or dragging underneath without trough. Standard 25-Foot Conveyors consist of necessary sprocket wheels, bevel gears, sprocket and gear shafts, boxes, collars, 50-foot carrier chain with conveyor attachments, and 10 feet of drive chain. Hopper, trough and other wood parts extra. No. 4 Carrier is equipped with roller drive chain and take up boxes.

ZIMMERMAN PATENT WHEEL-GUARD AND TRACK CLEANERS

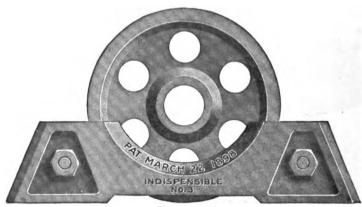


Fig. 7548A

FOR ANY DIAMETER WHEELS

| Price | , for | _ 2 | Block | Carriage | (4 Shoes) | | 40.00 |
|-------|-------|--------|-------|----------|--------------------------------|-------|-------|
| " | • • | 3 | ** | " | (up to and including 6 Shoes) | - " | 50.00 |
| | | • | | " | (up to and including 8 Shoes) | " | 65.00 |
| ** | " | 5 | ** | •• | (up to and including 10 Shoes) | • • • | 75.00 |

The above prices apply only to 14 and 16 inch diameter sizes.

All Wheels on Sawside of Carriage being equipped, as we never furnish these Guards except in full sets, or one for each Wheel on Sawside of Carriage.

For 18 and 20-inch sizes, add 20 per cent to above prices. For 10 and 12-inch sizes, deduct 15 per cent from above sizes.

The Zimmerman Patent Wheel-Guard and Track Cleaner is the only device ever invented that insures a Clean Track, Smooth Running Carriage, hence better running Saws, and evener Lumber. No possible interference with offset of Band-Mill Carriage. No trouble to put on. No repairs to follow.

Made for both Flat and V Track.

The Spoked or Armed Wheels require the same opening in the Guard as the Web Center with Ribs or Brackets on sides. The Plain Web, as shown in above cut, requires less opening, and will not admit the Spoked or Ribbed Web; hence the importance of knowing which kind you have.

The Zimmerman Patent Wheel-Guard and Track Cleaners are now in use by thousands of the best Sawmills in the South and the Pacific Coast.

Special Instructions to Observe in Ordering, so there can be no possible chance for misfit:

- 1st. Give Diameter of Wheel and Width of Face on Track.
- 2nd. Give Style of Wheels; whether they are Plain, Web Center or Spoke.
- 3rd. If Web Center, state whether Webs have Brackets or Ribs to strengthen them.
 - 4th. State if Flat or V Track.



SAW-MILL MACHINERY

WIRE ROPE FEED ATTACHMENTS

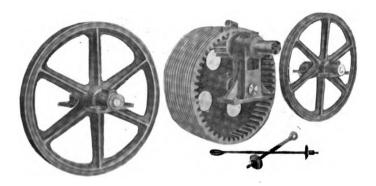


Fig. 2086A

CARRIAGE BUMPERS

SPRING BUMPER



Fig. 2086B

AIR CUSHION

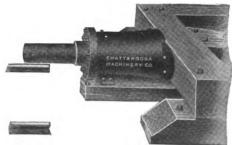


Fig. 2086C

Spring bumpers made in sizes to suit requirements. Air cushions for saw mill carriages made in six sizes. Prices on application.

BROWNLEE STEAM FEEDS

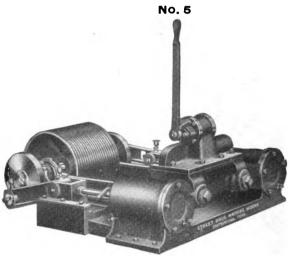


Fig. 8024A

No. 5 Brownlee Steam Feeds made in 3 styles: Type A, with 20x14-inch rope drum on engine direct; Type B, with drive, gear mounted on bed plate of engine and rope drum on shaft extension under carriage; Type C, with gear wheel in front of engine on extension plates, all with cylinder 7×8 inches.

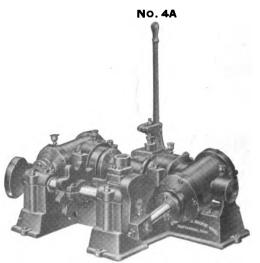
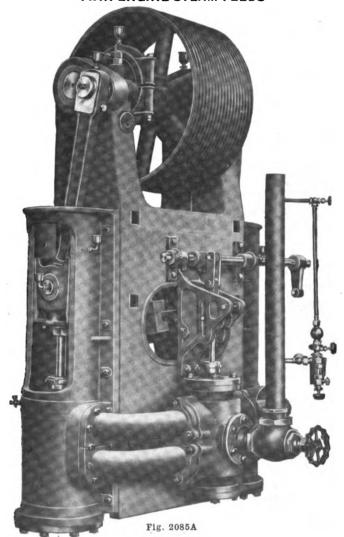


Fig. 8024B

No. 1 Brownlee Steam Feeds have cylinder $31/2 \times 4$ inches, weigh 750 pounds. No. 4 and No. 4A Brownlee Steam Feeds have cylinders 6×7 inches and weigh 1000 pounds. can be bolted direct to the husk frame or attached in any convenient way.

SAW-MILL MACHINERY TWIN ENGINE STEAM FEEDS

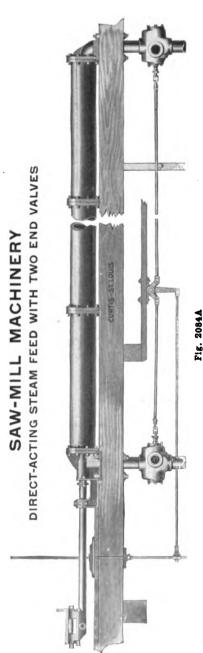


This feed is desirable for cutting very long timbers.

The main frame is one massive box casting to which the smaller parts are attached. Slip joints on the port pipes allow for expansion. All wearing parts are unusually large to insure reliability and long life.

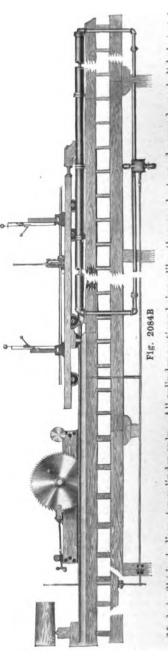
All feeds are tested under steam before shipping, and are guaranteed as to material and workmanship. Our 9x12-inch feed is suitable for mills cutting 30,000 feet o. less in 10 hours; has 30-inch drum for $5\sqrt{0}$ or 34-inch rope. Weighs 5000 pounds. Our 11x18-inch feed is suitable for mills cutting over 30,000 feet; has 36-inch drum suitable for 34, 78, or 1-inch rope. Weighs, 8000 pounds. Prices on application.

DO NOT CUT CATALOGUE, ORDER BY FIGURE NUMBER.



Made with cylinders 8-inch and 10-inch diameter. Bearing in front of stuffing lox takes wear off packing.

DIRECT-ACTING STEAM FEED WITH CENTER VALVE



Made in 612-inch diameter cylinder only. All cylinder sections being alike, they can be turned around one bolt hole to take even wear from piston,

CURTIS GANG EDGERS

50 AND 60-INCH FRONT VIEW WITH TABLE REMOVED

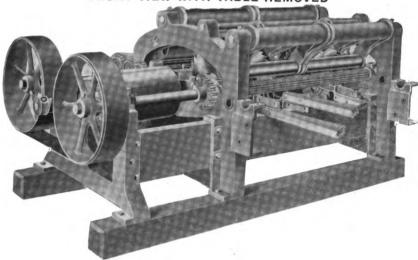
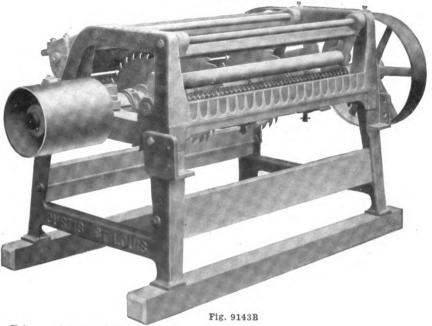


Fig. 9143A 32 AND 42-INCH



Prices and further information on application.

DIXIE TWO SAW TRIMMERS



at point of cutting, giving support to the arbor where most needed, and insuring its running perfectly true. The transfer beams are a heavy section of cast iron, and are moved from one end of trimmer, each turn of the crank moving the saws two It has four stationary self-oiling bearings, and two bearings in the transfer beams the feed is a special feature of our trimmers having two speeds. It can be changed instantly from fast feed to slow feed, or stopped entirely while the trimmer is running. This gives our machine a very large range of work with a maximum capacity in The frame is made of four iron sections rigidly connected with seasoned timbers. The arbor is made of two pieces coupled together, The feed shaft is carried in four rigid bearings. Made in Nos. 1 and 2 size 16, 20, or 24-foot cut. with a flange coupling turned all over. whatever is being cut.

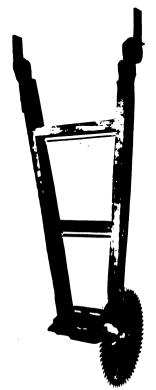
Prices and further information on appplication.

DO NOT CUT CATALOGUE, ORDER BY FIGURE NUMBER.

SAW-MILL MACHINERY WOOD FRAME SWING SAWS

No. 2 NO COUNTERSHAFT OR GUARD

No. 4 WITH COUNTERSHAFT AND GUARD



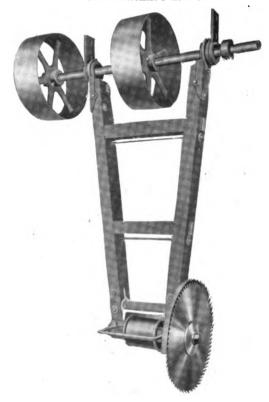


Fig. 2088A

Fig. 2088B

| No. | Diameter of Saws Inches | Diameter of Arbor Inches | Diameter of Saw Seat Inches | | | Size of Drive Pulley Inches | Frame Timbers Inches |
|-----|-------------------------------|--------------------------------|-----------------------------------|---|--------|-----------------------------------|--------------------------------|
| 2 | 18 to 32 | 1,5 | 13, | 5 | 6x71 | 20x6 | 5½x2½ |
| 4 | 34 " 46 | 1 2 | 112 | 9 | 8x81.5 | 24x9 | 5½x3½ |
| 5 | 48 " 60 | 2^{3}_{16} | 2 | 9 | 9x11 | 24x11 | $71\sqrt{2} \times 31\sqrt{2}$ |

No. 4 ARBOR
With 9-inch Steel Collars



Fig. 2088C

Arbors only, hinges only or complete irons with or without countershaft can be furnished.

Saw guards can be furnished.

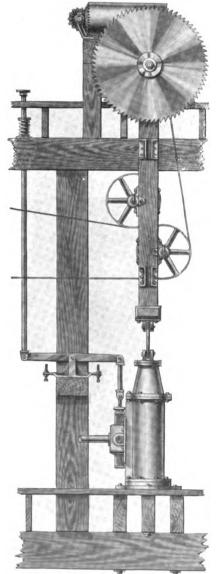
Complete irons include all necessary bolts.

SWING SAW HINGES



Fig. 2088D

STEAM JUMP SAW CUT-OFF SAWS 6-FOOT IRON FRAME SWING SAW



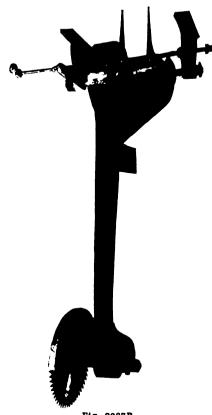


Fig. 2087B

JUMP SAWS

Made in two sizes. The smaller one has an 8-inch cylinder of 12 to 18-inch stroke and carries saws from 26 to 36 inches in diameter, and 8-inch belts. The larger has 10 inch cylinder, 18 to 22-inch stroke; carries saws 40 to 54 inches in diameter, and 10-inch belt.

The saw collars are of steel, 9 inches in diameter. We furnish the cylinder only, or complete saw, as may be ordered.

These jump saws are meant for hard use.

Fig. 2087A SWING SAWS

Our 6-foot Swing Saw is a heavy powerful machine designed for constant hard work. The frame is adjustable so saw will trim large timber perfectly square. Machine is furnished complete with saw shield, shifter, countershaft, counterweight, but no saw or belt. Machine carries a 5-inch belt and saws up to 30 inches in diameter.



LIVE ROLLS

STANDARD 10x24-INCH LIVE ROLL WITH HARD CHILLED GEAR CAST INTEGRAL WITH THE ROLL

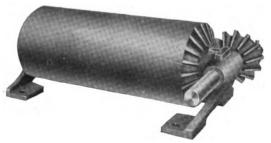


Fig. 2091A

STANDARD LIVE ROLL WITH SEPARATE GEAR AND ANGLE BOX



Fig. 2091B

ANGLE BOX AND HOOD

>::::14:: > ::1:::

SCREW ROLL

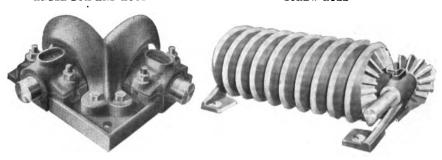


Fig. 2091C

Fig. 2091D

LIVE ROLL DRIVE RIGS No. 2

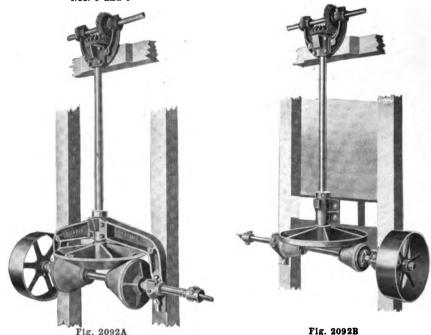


Fig. 2092B

The No. 6 Drive Rig has bevel friction, 36x12 inches; paper frictions 15x12 inches, with best tarred-fibre fillers. The cast-steel mitre gears are 9 inches in diameter. The vertical shaft is $2\frac{15}{16}$ inches, and horizontal shaft, $2\frac{7}{16}$ inches. The rig is designed for the heaviest service in large mills.

The No. 5 Drive Rig has 30x9-inch bevel friction on 276-inch vertical shaft. The paper frictions are 15x9 inches on 236-inch shaft. The mitre gears are 9 inches in diam-

eter and of cast iron. This rig will drive 15 of our 8 or 10-inch rolls.

The No. 2 Drive Rig has no iron lower yoke; iron friction is 30x6 inches on 21/16-inch shaft; the paper frictions are $8\frac{1}{2}x6$ inches on 1^{11} linch shaft. The mitre gears are 9 inches in diameter and of cast iron. This rig is intended for twelve or less, 8 or 10-inch rolls.

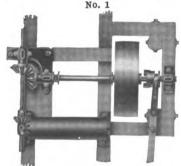


Fig. 2092C

The No. 1 Drive Rig is intended for driving eight or ten 6-inch rolls, or six or seven 8-inch rolls. It is usually placed horizontally, as shown in cut, but it can be used vertically.

All of our paper frictions have 1-inch straightface backing. Drive rigs have friction of ample size, large diameter shafts, accurate heavy gears and good boxes.

FRICTION LOG HAUL-UPS DOUBLE GEARED

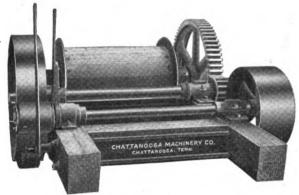


Fig. 8004A

SINGLE GEARED

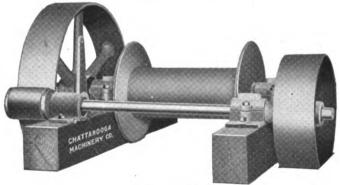
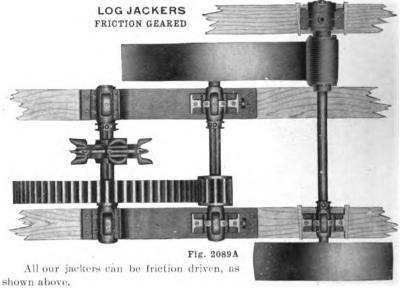


Fig. 8004B

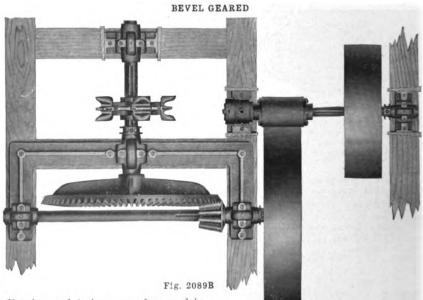
Made single and double geared with wood or iron drums, 6 to 30 inches in diameter and up to 36 inches long. They can be furnished with reversing mechanism, for unwinding the rope on drum.

STANDARD SPECIFICATIONS

| Type of Machine | Dov | BLE GE | RED | SINGLE GEARED | | | |
|-------------------------------|-------|--------|----------------|---------------------------------------|-------|-------|--|
| Machine Number | 15 | 50 | 21 | 0 | 2 | 6 | |
| Size of Druminches | 30x36 | 20x36 | | 6x24 | 10x24 | 24x36 | |
| Diameter of Drum Shaft " | 356 | 37/6 | 25/6 | 27/6 | 27/6 | 311/ | |
| Size of Bull Gear " | 48x6 | 40x5 | 30x4 | | | | |
| " " Pinion | 8x6 | 7x5 | 7x4 | | | | |
| Diameter of Pinion Shaft | 215/6 | 27/6 | $2\frac{3}{6}$ | | | | |
| Size of Iron Friction | 40x8 | 30x8 | 30x6 | 32x8 | 30x6 | 48x10 | |
| " "Paper Friction " | 10x8 | 8x8 | 8x6 | 6x8 | 6x6 | 12x10 | |
| Diameter of Drive Shaft | 276 | 23/16 | 156 | 1 ¹ / ₆ 16x8 | 115/6 | 2% | |
| Size of Drive Pulley " | 30x10 | 24x10 | | | 24x6 | 48x10 | |
| Speed of Drive Pulleyr. p. m. | 290 | 425 | 325 | 350 | 200 | 75 | |



Spur-geared jackers are generally used for circular mills.



Bevel-geared jackers are often used in band mills on account of the usual arrangement of the shafting. Prices on application.

LOG JACKER SPROCKETS

*FOOT WHEEL





Fig. 2090A
*Does not bend chain. Prices on application.



Fig. 2090B

JACKER AND CONVEYOR CHAIN

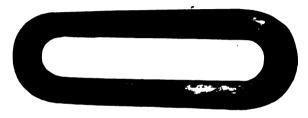


Fig. 2090C

This chain is made of B. B. B. refined chain iron. The links are machine bent and are all of exactly the same pitch. The weld is very long and is enlarged so as to have full strength of link,

Regularly furnished in the following sizes:

| Pitch | inches | 5 | 6 | 7 | 8 |
|--------------|--------|---------------------------------|-----------|------------|---------------|
| Size of Iron | inches | $\frac{1}{2}$ and $\frac{5}{6}$ | 34 and 78 | 1 and 11/8 | 11/4 and 13/8 |

Special sizes made to order, of all pitches and sizes.





DOGS

HEAVY Not Fitted

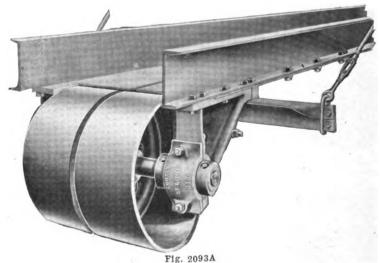


Fig. 2090D

Fig. 2090E

These dogs are made of hard iron, chilled on the points and where they slide on the steel ways. Can be cast of steel. We are prepared to furnish steel ways for log trough. Prices on application.

REFUSE CONVEYORS



Our conveyor troughs have many good points to commend them to the experienced mill man. The sides are 8-inch steel channels 20 to 40 feet long. The bottoms are of cast iron and in five-foot sections. The drums are 24-inch diameter by 21-inch face and run in ball and socket boxes bushed with Hyatt roller bearings. The supporting rods are carried well out from the trough so as not to catch misplaced slabs. The trough is 26 inches wide inside so as to receive our standard 24-inch steel cleats. Like all our designs this trough is very well thought out and practical. The bearings in the drum over the fire are subject to very severe conditions, but we have never received a single complaint

DRIVE RIGS

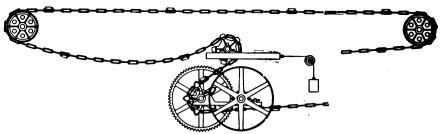


Fig. 2093B

Our standard conveyor drive rigs are provided with three idler drums, except when furnished with a fire end trough, which has its own idler. We recommend the above method of installing conveyor drive rigs, as the chain while under strain always passes over the sprockets with the same direction of bend and the links are not subject to bending first in one direction then in the other. We furnish the idlers with shafts, boxes, collars, and heavy cast iron drums. When conveyor drive is sold without fire end trough, the head drum is as specified on our trough head drum, and has roller bearing boxes. Our conveyor sprockets permit the cleats to pass between the teeth.

COLEMAN IMPROVED SLAB CONVEYOR CLEAT

IN OPERATION

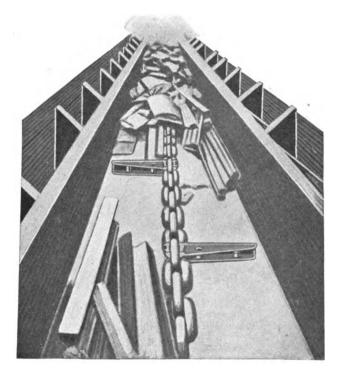


Fig. 8293A

CONVEYOR CLEAT ARM



Fig. 8293B

The new improved Coleman Slab Conveyor Cleat, for handling slabs, saw dust, or shavings, saves time, labor, and power. It pays for itself in sixty days. Sent on thirty days' trial, and if then found not satisfactory there is no cost to users.

Prices on application.

SAWDUST CONVEYOR DRIVES

SPUR GEARED

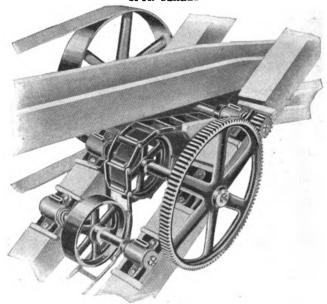


Fig. 2094A BEVEL GEARED



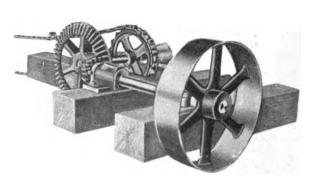
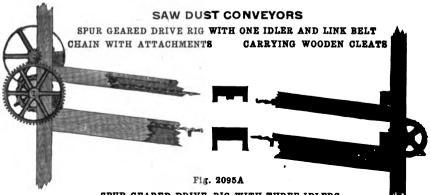


Fig. 2094B

| | 1 3 | 0 | |
|---------------------------|-----------------|-----------------------------------|---------------|
| Size | . 2 | 3 | 3 |
| Pitch of Large Gearinches | 15 x 2½ x 1 | $26 \times 3 \times 1\frac{1}{4}$ | 33 x 5 x 11/2 |
| Diameter of Sprocket | 12^{1} $_{2}$ | $13\frac{1}{2}$ | 17 |
| Size of Drive Pulley " | 20 x 4 | 24 x 6 | 36 x 8 |



SPUR GEARED DRIVE RIG WITH THREE IDLERS

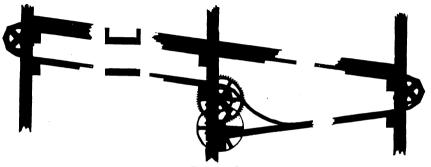


Fig. 2095B

SPUR GEARED CONVEYOR DRIVE FURNISHED WITH ONE, TWO, OR THREE IDLERS

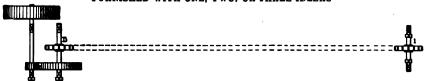
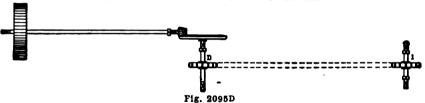


Fig. 2095C

BEVEL GEARED DRIVE RIG FURNISHED WITH ANY NUMBER OF IDLERS



CHATTANOOGA EDGING GRINDER OR HOG

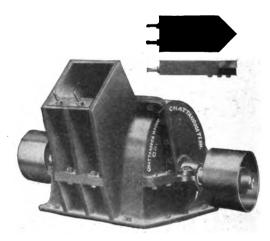


Fig. 6881A

| Number Size of Spout Inches Size of Wheel Inches Inches Single Double Single Single Double Single Si | SPOUT | | Wheel | PULLEYS | | Number | Size of Frame | Speed R. P. M. | Weight Pounds | Price Each |
|--|--------|--------|--------|---------|-------|--------|------------------|-------------------|------------------|---------------|
| | Double | Knives | Inches | 3.5 | | | | | | |
| 1 | 8 | 6 | -22 | 10x10 | 10x 6 | 6 | 24x36 | 1100 > | 1550 | 500,00 |
| 2 | 10 | 12 | 24 | 12x12 | 12x 8 | 12 | 28x40 | 1100 | 2475 | 720.00 |
| 3 | 10 | 18 | 26 | 15x12 | 15x 9 | 18 - | 36x40 | -1000 | 3000 | 820.00 |
| 5 | 10 | 9 | 30x15 | 15x14 | 15x10 | | 32x46 | 1200 | 2650 | 520.00 |
| 10 | 13 | 12 - | 36x16 | 18x14 | 18x10 | | 48x36 | 1000 | 3150 | 640.00 |
| 15 | 20 | 12 | 36x16 | 18x14 | 18x10 | | 48x36 | 1000 | 3100 | 650.00 |
| 20 | 20 | 16 | 40x24 | 20x14 | 20x10 | | 42x56 | 1000 | 5000 | 1000.00 |
| 25 | 22 | 20 | 40x30 | 20x16 | 20x10 | | 54x60 | 1000 | 7000 | 1300.00 |
| 30 | 22 | 16 | 48x26 | 26x20 | 26x12 | | 66x75 | 700 | 8500 | 1400.00 |

All cylinders are semi-steel. State whether right or left hand.

Pulleys changed to meet requirements at cost.

One set of knives furnished in cylinders and one extra set at above prices.

Add 2 per cent to list prices for each outboard bearing.

Add 4 per cent to list prices for two pulleys instead of standard pulley.

The light machines are suitable for handling waste material from planing mills, furniture factories, shingle mills, etc.; medium weight machines for cutting slabs, spalts or blocks, and extra heavy grinders for cutting up cord wood for extract plants, etc. Built either with single or double pulleys, and either style with or without outer mandrel bearings.

Anvil knife is so designed that all four edges can be utilized without regrinding. All bearings are self-oiling, water jacketed, and piped for connections.



THE STANDARD DRY KILN

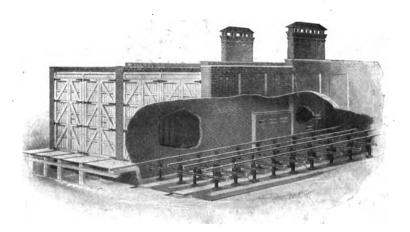


Fig. 3356A

We are absolutely certain that "The Standard" is the kiln you need.

We think we can conclusively prove this to you by showing you what successful results are being obtained by concerns that are drying the same kind of lumber you want to dry, under the same conditions.

We write it in our contracts that The Standard Dry Kiln is guaranteed to dry a satisfactory (stated) capacity of stock in a satisfactory manner.

If it fails to prove up our definite claims, you need not keep it need not pay for it. There isn't an "if" or a "perhaps" connected with our proposition.

The whole thing depends upon our "making good," upon the success of The Standard Drying System.

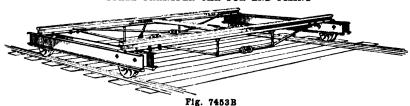
Write us for special printed matter.

DRY KILN BUNKS, ETC.

ROLLER BEARING STEEL CAR BUNKS



STEEL TRANSFER CAR FOR END PILING

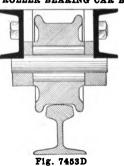


PRESSED STEEL WHEEL BOX SECURELY BOLTED BETWEEN CHANNELS





Fig. 7453C



WHEELS USED IN THE DRY KILN BUNKS FRONT VIEW SIDE VIEW



Fig. 7453E



Fig. 7453F

Cast Iron Wheels, with Roller Bearings, are used in the Dry Kiln Car Bunks. These Wheels are turned true on the tread with the center, insuring easy traction.

We can furnish Malleable Iron Wheels if so desired.

Prices of Trucks, Bunks, etc., on application



No. 126 PLANER, MATCHER AND MOULDER

CAPACITY-24 INCHES WIDE, 6 INCHES THICK, MATCHES 12 INCHES WIDE

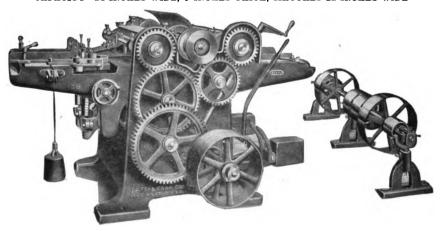


Fig. 9548A

No. 275 DOUBLE CYLINDER, PLANER AND MATCHER

CAPACITY-10, 16, 20, 24 INCHES WIDE AND 8 INCHES THICK

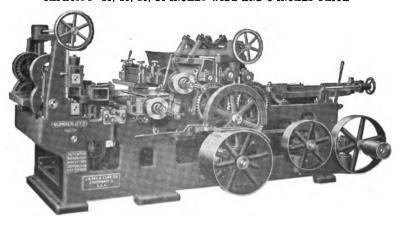


Fig. 9548B

No. 224 SINGLE CYLINDER SURFACER CAPACITY—24 INCHES WIDE. 8 INCHES THICK

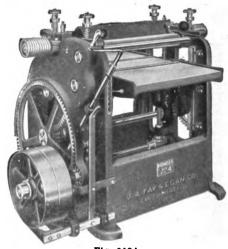


Fig. 642A

No. 140 HEAVY DOUBLE CYLINDER SURFACER CAPACITY -24, 27 AND 30 INCHES WIDE, 8 INCHES.THICK

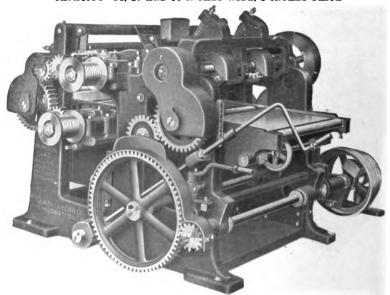


Fig. 642B



No. 143 IRON FRAME RIP SAW

CAPACITY:-WILL RIP 19 INCHES WIDE AND 6 INCHES THICK



Fig. 9468A

No. 110 SELF-FEED RIP SAW

CAPACITY:-WILL RIP 18 INCHES BETWEEN SAW AND FENCE AND UP TO 41/2 INCHES THICK

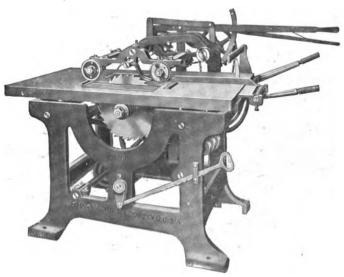


Fig. 9468B

No. 265 DOUBLE SPINDLE SHAPER

SPINDLES 26 INCHES APART

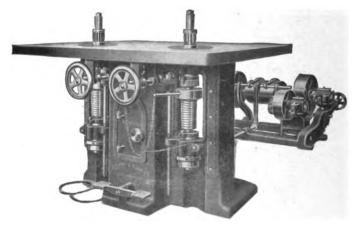


Fig. 2395A

No. 209 SEVEN-INCH MOULDER

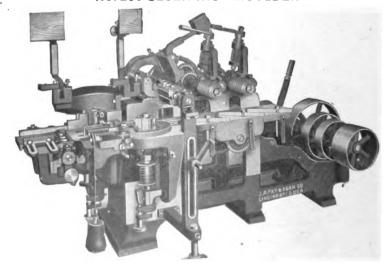
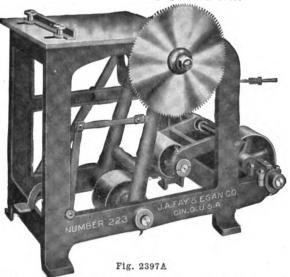


Fig. 2395B

No. 223 INVERTED SWING SAW



Capacity:—Will cut off material 1 inch thick up to 20 inches wide, or 4 inches thick by 8 inches wide.

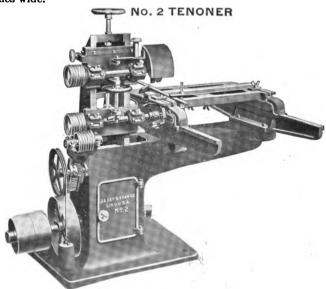


Fig. 2397B

Capacity:—Will tenon and cut off material 20 inches wide and will make a tenon up to 31/4 inches long at one cut; 61/2 inches long with two cuts.

Prices on application.

WOOD-WORKING MACHINERY No. 66 IMPROVED PATENT POWER MORTISER



Fig. 2695A

Capacity: Has chisel thrust of 4 inches and receives material 14 inches under chisel and 6 inches between fence and clamp.

No. 50 BAND SAW DIAMETER OF WHEELS, 36 INCHES

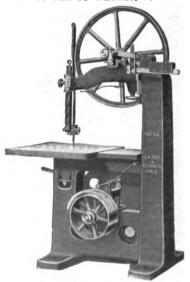


Fig. 2695B

No. 61 HAND PLANER AND JOINTER

CAPACITY-8, 12, 16, 20 and 24-INCH WIDTHS



Fig. 2394A

No. 62 UNIVERSAL WOOD-WORKER

CAPACITY-1012 and 12-INCH WIDTHS

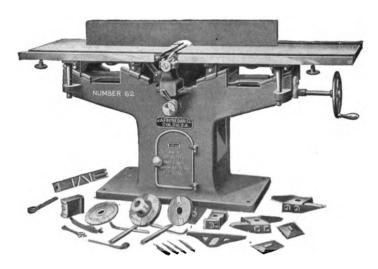
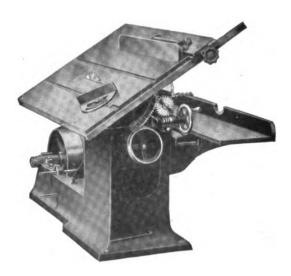


Fig. 2394B

CRESCENT COMBINATION SAW TABLES

No. 2



Pig. 5886A

| Size of Table | | | | | | .inches |
|------------------|----------|---------|-----|-----------------|---------------|---------|
| " " Mandrel | Hole for | Saw | | | . | . " |
| " " Tight and | d Loose | Pullevs | | | | . " |
| Height of Table | from Flo | or | | | | . " |
| Takes Saws up t | | | | | | |
| Floor Space with | | | | | | |
| " " with | 1 " | 6 | | | | . " |
| Speed of Counte | | | | | | |
| | | | | | - " | " |
| Weight without | Boring A | ttachm | ent | . . | | pounds |
| " with | | 66 | | | | |
| Price without | ** | 44 | | | | |
| " with | ** | +4 | | | | |

This machine is adapted to rip-sawing, grooving, rabbeting, beveling, cutting-off etc. The saw is raised and lowered by hand-wheel under table and will stop at any point without fastening, but can be clamped fast at any point. The table is iron and tilts to any angle to 45 degrees. The ripping fence also tilts to any angle to 45 degrees. The adjustable cut-off fence may be set at any angle. The machine will swing a 14-inch saw and cut through a piece 4 inches thick. Saws larger than 14 inches cannot be used. A groover-head 2 inches wide may be used and it requires a head 8 inches in diameter to groove 1 inch deep. Wood-boring attachment with wood table and self-centering chuck furnished when ordered. The machine may be furnished motor-driven if desired.

Each machine is furnished with one 12-inch rip-saw, one ripping-fence, one cut-off fence, one 4-inch endless belt and one mandrel wrench.

CRESCENT SAW TABLES



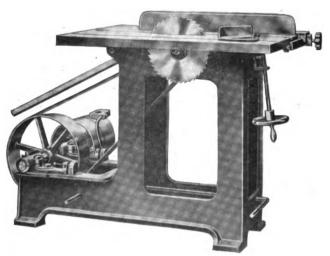


Fig. 5887A

| lize of Table | inches |
|------------------------------|--------|
| " " Mandrel Hole for Saw | |
| " " Tight and Loose Pulleys | |
| Ripping-Fence opens from Saw | |
| akes Saws up to | " |
| loor Space | |
| peed of Countershaft | |
| " " Saw | |
| Veight | pounds |
| rice | |

This machine is suited for shop and factory and use in packing rooms for sawing box and crate material. The table is cast iron and hinged at back and has wooden throat piece to suit for grooving.

The ripping-fence will tilt to any angle to 45 degrees for bevel sawing.

The cut-off fence adjusts to any angle. A 12-inch saw will cut through a piece $2\frac{1}{2}$ inches thick.

The belt-shifter is operated by a small lever at front near the floor by hand or foot. Each machine is furnished with one 12-inch saw, one endless leather belt, one ripping fence, one cut-off fence and one mandrel wrench.

CRESCENT BAND SAWS



Fig. 5889A



Fig. 5889B

| Sizeinches | 20 | 26 | 32 | 36 | 38 |
|------------------------------------|------------|------------|------------|------------|---------------|
| Size of Wheelsinches | 20x111 | 26x1½ | 32x134 | 36x2 | 38 x 2 |
| Distance Clear, Saw to Frame " | 20 | 26 | 32 | 36 | 38 |
| Height Over All " | 67 | 78 | 81 | 92 | 102 |
| Height Clear Under Guide, raised " | 7 | 9 | 13 | 17 | 19 |
| Size of Table " | 18x22 | 20x24 | 24x28 | 28x32 | 30x36 |
| " " Tight and Loose Pulleys " | 7x3 | 10x3 | 12x31/2 | 12x4 | 16x4 |
| Length of Saw Blade feet | 10,1, | 1334 | 161/2 | 181/6 | 201/3 |
| Floor Space, Belt Powerinches | 20x30 | 30x40 | 35x48 | 39x57 | 44x62 |
| " '" Foot " " | 24x40 | l | | | |
| " " and Belt Power " | 30x40 | 30x40 | | | |
| Speedrevolutions per minute | 400 to 450 | 400 to 450 | 400 to 450 | 400 to 450 | 400 to 450 |
| Weight, Belt Powerpounds | 290 | 625 | 900 | 1200 | 1475 |
| " Foot " " | 375 | 675 | | | |
| " and Belt Power. " | 400 | 1 | | | |
| Price, Belt Powereach | | 80.00 | 105.00 | 130.00 | 170.00 |
| " Foot " " | 45.00 | | | | |
| " and Belt Power " | 50.00 | 90.00 | | l | |

All machines have iron tables and will tilt to any angle up to 45 degrees.

These machines except 20-inch may be furnished motor-driven if desired.

Each machine except the 20-inch is furnished with one anti-friction roller saw guide above table, one plain guide below table, one brazing tongs, one brazing clamp, and one saw blade, any width up to 1 inch. The 20-inch machine has plain guides above and below table, but all other equipment is the same as larger machines.

VENEER CUTTING MACHINERY

ROTARY CUTTER



Fig. 2137A

SLICER

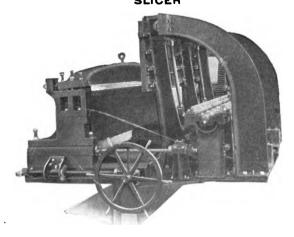


Fig. 2137B

Prices on application.

VENEER CUTTING MACHINERY



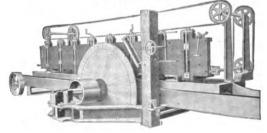


Fig. 2138A

WRINGER

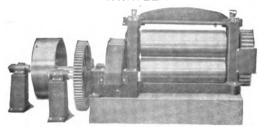


Fig. 2138B

KNIFE GRINDER



Fig. 2138C

Prices on application.



PERKINS SHINGLE MACHINES

MICHIGAN FAVORITE, HAND FEED SHINGLE MACHINE



Fig. 9133A
COLUMBIA FULL AUTOMATIC, POWER FEED SHINGLE MACHINE

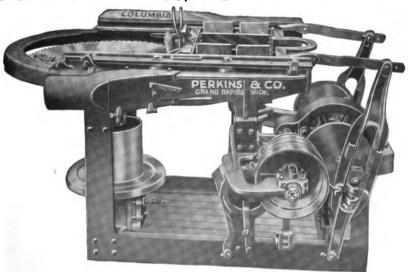


Fig. 9133B
Prices and further information on application.

PERKINS POWER FEED BOLTERS

RIGHT HAND MACHINE, CLASSES A. B. C AND D



Fig. 2121A

Has a friction feed. Operated by hand lever from either side of machine. Automatic stop to control travel of table. Adjustable gauges determine widths for dimension shingles. Especially designed for large mills, to quarter bolts that are sapped on a knee bolter; also to halve and cut bolts into flitches for dimension shingles. Exceedingly simple in design and operation.

CLASS A—Bolt table is faced with boiler plate 4 feet wide x 4½ feet long, geared to saw bolts 4 feet in diameter. Floor space 14 feet x 7½ feet; steel arbor 2½ inches in diameter; pulley 18x10 inches; speed 900 R. P. M., weight 2800 pounds.

Class B—For 50-inch or over saw. Same as Class A, except arbor is 3-inch diameter; driving pulley 20-inch x 12-inch; balance of bolter properly proportioned; floor space 15x7½ feet; weight about 3300 pounds.

CLASS C—Similar to Class B, but with longer table. Bolt table faced with boiler plate 4 feet wide x 6½ feet long, to cut bolts 6 feet in diameter. Size 18x7½ feet; speed 900 R. P. M.; weight about 4000 pounds.

CLASS D—For large mills. Table 4^{1}_{2} feet wide x 12 feet long. Floor space 29 feet x 10 feet; weight about 9000 pounds.

Order must specify dimension width to be cut, as 4, 5 and 6 inch, or 4, 5 and 6 inch shingles.

The following table gives proportionate diameter of saws to be used on bolter, allowing 4-inch wear to length of shingles cut.

| Size Shingles Inches | Size Saw Inches | Revolutions per Minute | Size Shingles Inches | Size Saw Inches | Revolutions per Minute |
|-------------------------|--------------------|---------------------------|-------------------------|--------------------|---------------------------|
| 18 | 50 | 900 | 24 | 62 | 700 |
| 20 | 54 | 800 | 26 | 6 6 | 600 |
| 22 | 58 | 800 | 1 1 | •• | |

Prices on application.

PERKINS CHAMPION DRAG SAW MACHINES

CLASS B

Friction driven. Saw speed 200 to 225. Iron friction 24x8 inches. Paper friction 6x8 inches. Belt pulley 16x8 inches. Speed 600. Floor space for frame 13 feet 6 inches x 3 feet 6 Stroke 31 inches. Diameter balance wheel 42 inches. 7 types to choose from. Weight with friction operated elevator for lifting saw out of cut, 2880 pounds.

Starts and stops instantly. Friction very durable and Belted direct from line shaft. easily replaced.

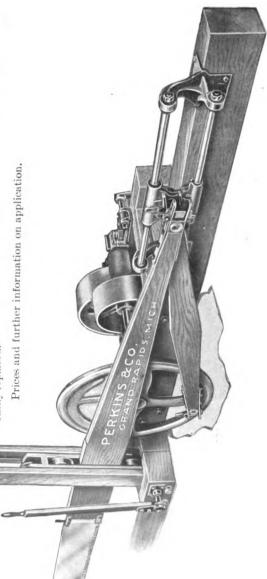
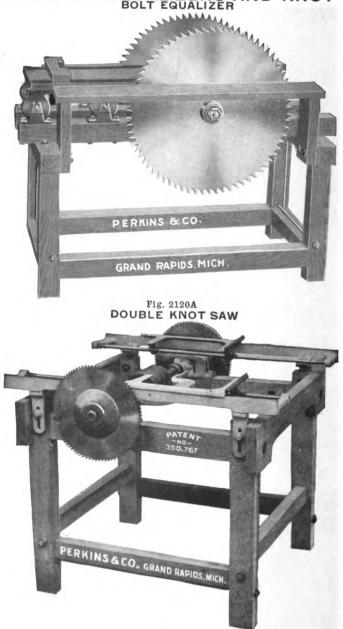


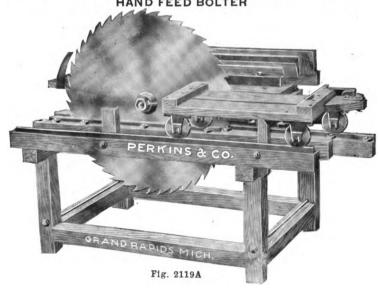
Fig. 2122A

PERKINS BOLT EQUALIZERS AND KNOT SAWS



Prices and further information on application.

PERKINS BOLTERS AND SHINGLE PACKERS HAND FEED BOLTER



SHINGLE PACKER



Prices and further information on application.

. CACE, CREEN BY FINCHE NOMBER.

LATH AND SHINGLE MACHINERY

LATH BINDERS AND TRIMMERS

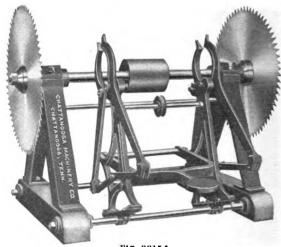


Fig. 8015A

The packing frame can be tilted forward, causing bundle to pass between the saws, trimming both ends at one movement. Saws 28 inches diameter furnished for 50 lath bundles and 30 inches diameter for 100 lath bundles.

IRON FRAME SHINGLE BUNCHERS



Fig. 8015B

End pieces made of cast iron securely bolted together and arranged so that loose boards can be put in to change from 10 to 20-inch shingle. Weight 175 pounds.

GANG BOLTERS AND LATH MILLS

NEW MODEL EUREKA GANG BOLTERS



Fig. 8013A

Designed primarily for cutting slabs into lath bolts, but can be adapted to a variety of work. Has upper and lower, front and rear, fluted feeding rolls, power driven. Maderight and left hand. Specify which is wanted in ordering. Weight, 1450 pounds.

MAMMOTH GANG LATH MILLS

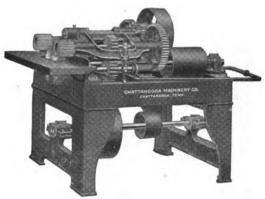


Fig. 8013B

Arbor carried in water jacketed boxes with extra long bearings, feed rolls fluted and chilled, entire feed works gear driven, countershaft beneath machine driven from line shaft direct.

SPECIFICATIONS

| Diameter of Arbor Length of Arbor Bearings | | 115% |
|--|---------|---------|
| Size of Arbor Pulley | . " | 10 x 12 |
| Five Saws, diameter | | 12 |
| Weight | pounds | 2000 |
| Size of Top Feed Pulley | .inches | 16 x 5 |

STAVE JOINTERS AND TONGUE AND GROOVE MACHINES

STANDARD STAVE JOINTERS



Fig. 8019A

Machine equipped with improved planer knives. Width and bilge of staves can be changed when machine is in operation.

TONGUE AND GROOVE MACHINES

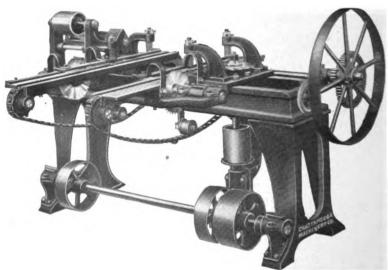


Fig. 8019B

Cuts tongue on one end and a groove on the other, of stock intended for crate heads, and is adjustable by means of a screw and hand wheel, from 9 to 40 inches. Special catalogues and circulars on application.

WOOD SPLITTING MACHINES

CHATTANOOGA



Fig. 8017A

LOMBARD



Fig. 8017B

CHATTANOOGA

Frames are heavy cast iron, thoroughly cross braced and further strengthened by four 1 inch rods running from base through box caps at top. Drive shaft bearings are long and babbitted. Stroke, 8 inches. Axes have reciprocating vertical motion. Adjustable table. Splits wood up to 24 inches. Made single and double and light and extra heavy. One horse power operates the double machine.

SPECIFICATIONS

| Floor Space | 4x4 |
|---|---------------------|
| Height, Floor to Center of Drive Shaft" | 61/4 |
| *Weight, Extra Heavy Single Machinepounds " " Double Machine" | $\frac{61}{3}$ 2000 |
| " " Double Machine " | 2400 |
| " Light Single Machine " | 1500 |
| " Double Machine " | 1800 |
| Size Drive Pulleyinches | 36x6 |
| Speed " "r. p. m. | 75 to 100 |

^{*}Weights given are approximate.

LOMBARD

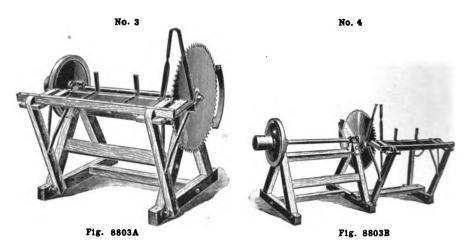
Frames are solid cast iron. Extra strong bearings for crank shaft. Adjustable corrugated top table. Steel axles. Cuts any length up to 20 inches. Made single or double.

SPECIFICATIONS

| Size of Drive Pulleyinches | 36x6 |
|--|--------------|
| Speed of Drive Pulleyr. p. m. | 125 |
| Floor Spacefeet | 31/2 x 4 1/2 |
| Height from Floor to Center of Drive Shaft | 101/6 |
| Approximate Weightpounds | 2000 |

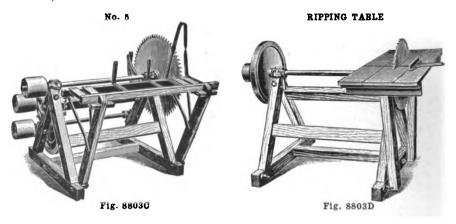
Prices on application.

CORD WOOD SAWS



No. 3 takes 30-inch or smaller saw, $1\frac{1}{4}$ -inch hole; mandrel, 54 inches long, pulley 6×6 inches; shipping weight, 300 pounds.

No. 4 takes 30-inch or smaller saw, 114-inch hole; shipping weight, 330 pounds.



No. 5 takes 30-inch or smaller saw, 114-inch hole; shipping weight, 335 pounds. Ripping Table can be attached to Nos. 3, 4 or 5, wood saw; weight of table, 40 pounds Prices quoted on receipt of specifications.

SLAB SLASHERS AND WOOD CUTTERS

SELF-CONTAINED UNDER-CUT SLAB SLASHERS

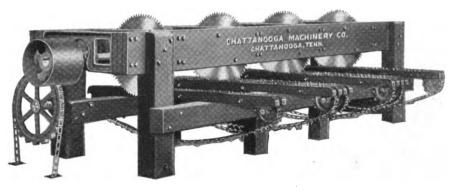


Fig. 8028A

Heavy frame complete with chain guides. Cut shows sprocket chain for connecting feed works to chain carrier shaft. Gears will be furnished if preferred. Arbor, 3% inches, 7 inch collars, saws clamped between collars. Made with any number of saws and to cut any length desired. Friction drive rig for carrier chain, independent of arbor drive rig. With sprocket chain on feed works, these may be placed under the floor out of the way.

THREE-SAW FOUR-FOOT WOOD CUTTERS

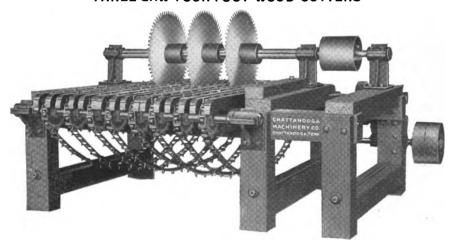


Fig. 8028B

Used with slasher for cutting 4 foot slabs into 12 inch or 16 inch stove wood. The feed works are stopped or started by tight and loose pulleys. Arbor, $2\frac{\pi}{6}$ inches diameter with 10×10 inches arbor pulley. Two or three 26-inch saws are regularly furnished.

PATENT RE-SAW MACHINES

FOR LUMBER, TIMBER AND SLABS

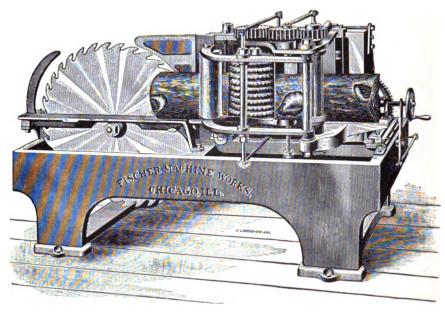


Fig. 6117A

In the above illustration is shown a new device of a re-saw machine for lumber, timber and slabs, which will make slabs into boards of any thickness, re-saw plank boards or timber of any length above two feet, adjusting itself automatically to limb knots and converting wedge-shaped lumber into valuable and properly sawed lumber.

This machine in connection with a Rotary, or Band Mill will enable a mill to cut 50

per cent more lumber per day.

This is done by the circular cutting the logs into $2\frac{1}{8}$ -inch planks and then re-sawing as they come from the circular into inch boards. By this your mill will do 50 per cent more work per day in connection with the re-saw, and a saving of $\frac{1}{8}$ of an inch in each cut that goes through the re-saw; the difference in the gauge of the saws. By it a majority of the waste material from the saw mill may be converted into box material, or cants and joists into lumber.

| Size of Saw Carried | inches | 42 |
|-------------------------------------|--------|--------|
| Cuts Thickness | inches | 1/8 to |
| Diameter of Driving Pulley on Arbor | | 20 |
| Face of Driving Pulley on Arbor | | 10 |
| Revolutions per Minute | | 900 |
| Floor Space, Length | inches | 84 |
| " " Width | | 66 |
| Weight | pounds | 4000 |

There have been many re-saws put in the market, but none which so fully answer all purposes, and in which all kinds of splitting can be so economically done. Prices upon application.

BUFFALO-CRAIN COMBINATION WOOD-WORKERS

VIEW SHOWING SPOKE EQUALIZER, BAND SAW, LATHE AND BORING MACHINE SIDE

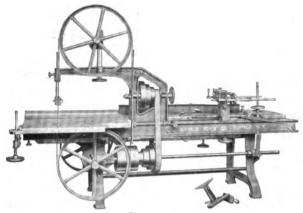


Fig. 9497A

VIEW SHOWING SAW MANDREL AND PLANER HEAD SIDE

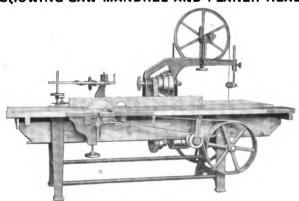


Fig. 9497B

Regularly furnished with 5-inch planer head, but on order with 10-inch head. Each machine is furnished with one 12-inch rip saw; one 12-inch cut-off saw; one pair 14-inch rounding bits; one band saw; one boring socket to hold bits with ½-inch round shanks; one small face plate for lathe; one pair of 5-inch straight planer bits on the 5-inch machine, and one pair of 10-inch straight planer bits on the 10-inch machine.

| Price co | mplete | with | 5-ir | ıch | Head | 300.00 |
|----------|--------|------|------|-----|------|------------|
| 44 | 46 | ** | 10 | 44 | ** | 350.00 |

Special catalogue, specification sheet, and discount on application.

OLIVER WOOD TRIMMERS

No. 1 FRONT VIEW



Fig. 314A

No. 1 REAR VIEW



Fig 314B

| Number | ‡ 0 | * 1 | +1 | ‡1 | 2 | 3 | ‡4 |
|------------------------------|-------------|---------|--------|-----------|----------|---------------|--------|
| Depth of Cutinches | 3 | 434 | 434 | 43_{4} | $5^{3}4$ | 71/2 | 6 |
| Length of Stroke " | 6 | 8 | 8 | 8 | 15 | 2034 | 13 |
| Trimming Areasquare inches | 15 | 24 | 24 | 24 | 70 | 135 | 60 |
| Size of Bedinches | 6:151/2 | 912012 | 9x2012 | 91201/2 | 111/2×26 | 18x34 | 14x33 |
| Net weightpounds | 22 | 195 | 160 | 62 | 320 | 525 | 210 |
| Price, without Triangleeach | 18.00 | 35.00 | 35.00 | 25.00 | 90.00 | 135.00 | 50.00 |
| " with Triangle " | · | 40.00 | 40.00 | 30.00 | -95.00 | 142.00 | 55.00 |
| Number | +4 | *4 | *7 | ‡9 | *9 | †9 | 10 |
| Depth of Cutinches | 6 | 6 | 41/2 | 434 | 43/4 | 434 | 9 |
| Length of Stroke " | 13 | 13 | 91 2 | 81/2 | 81/2 | 81/2 | 261/2 |
| Trimming Areasquare inches | 60 | 60 | 361/2 | 25 | 25 | 25 | 198 |
| Size of Bedinches | 14x33 | 14 x 33 | | 9x24 | 0x24 | 9x24 | 18x41 |
| Net weight pounds | 385 | 305 | 300 | 75 | 200 | 175 | 800 |
| Price, without Triangle each | $^{1}65.00$ | 65.00 | 75.00 | 30.00 | 40.00 | 40.00 | 200.00 |
| " with Triangle " | 70.00 | 70.00 | 80.00 | 35.00 | 45.00 | 45.00 | 210,00 |

^{*} With Column. † With Standard. ‡ For Bench.

WILLEY DIRECT CURRENT MULTIPOLAR MOTORS AND GENERATORS

TYPE "W"



Fig. 9361A

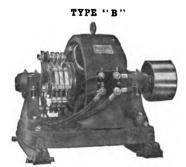


Fig. 9361B

TYPE "W"

| | FRA | MES | | MOTOR GENERATOR CAPACITY CAPACITY | | GENERATOR CAPACITY | | | | | |
|-------------|------------------|-----------------------------|----------------|-----------------------------------|----------------|-------------------------------------|-----------|--------|---------|-------|--|
| Size No. | | 1 | UAP | ACITI | | No. 16 C. P. 55 | | 1 | AMPERES | | |
| | Weight Pounds | Size of Pulley Inches | Rated H. P. | *R. P. M. | Rated K. W. | Watt Inc'd Lamps 125 Volts | *R. P. M. | 125 V. | 250 V. | 500 V | |
| 6/0G | 185 | 3 x 2 | 1/2 | 1600 | 1/2 | 9 | 1900 | 4 | 2 | | |
| 5/0G | - 275 | 31/2 x 21/2 | 1 | 1500 | 1 | 18 | 1700 | 8 | 4 | | |
| 4/0G | 325 | 4 x 3 | 2 | 1500 | 11/2 | 27 | 1500 | 12 | 6 | | |
| 3/0G | 400 | 6 x 3 | 3 | 1500 | 214 | 40 | 1500 | 18 | 9 | | |
| 2/0G | 440 | 6 x 4 | 4 | 1500 | 31/2 | 64 | 1500 | 28 | 14 | | |
| OG | 670 | 7 x 4 | 6 | 1500 | 5 | 90 | 1500 | 40 | 20 | | |
| 1G | 610 | 7 x 4 | 71/2 | 1500 | 6 | 109 | 1500 | 48 | 24 | | |
| 2G | 1060 | 9 x 5 | 10 | 1250 | 81/4 | 150 | 1250 | 66 | 33 | | |
| 3. | 1150 | 10 x 6 | 15 | 1250 | 111/2 | 210 | 1250 | 92 | 46 | | |
| 5 | 1375 | 11 x 6 | 20 | 1200 | 15 | 270 | 1200 | 120 | 60 | | |
| 5 | 1835 | 12 x 8 | 25 | 1100 | 201/2 | 360 | 1100 | 164 | 82 | | |
| 6 | 2355 | 14 x 9 | 30 | 900 | 221/2 | 400 | 900 | 180 | 90 | | |
| 7 | 2825 | 14 x 10 | 40 | 800 | 30 | 540 | 800 | 240 | 120 | | |
| 8 | 3400 | 16 x 10 | 50 | 800 | 40 | 720 | 800 | 320 | 160 | | |

TYPE "B"

| 6 | 3750 | 16 x 10 | 50 | 700 | 40 | 720 | 650 | 320 | 160 | 80 |
|----------------|---------------|---------|-----|-----|-----|------|-----|------|-----|-----|
| 6^{1}_{12} | 4300 | 18 x 12 | 60 | 700 | 50 | 900 | 700 | 400 | 200 | 100 |
| 7 - | 4850 | 18 x 12 | 75 | 750 | 60 | 1080 | 775 | 480 | 240 | 120 |
| $7\frac{1}{2}$ | 5000 | 20 x 14 | 85 | 750 | 65 | 1170 | 750 | 520 | 260 | 130 |
| 8 | 6450 | 20 x 14 | 100 | 650 | 80 | 1350 | 600 | 600 | 300 | 150 |
| 81/2 | 9450 | 22 x 16 | 115 | 600 | 100 | 1800 | 550 | 800 | 400 | 200 |
| 9 | 11000 | 24 x 18 | 125 | 600 | 120 | 2160 | 550 | 960 | 480 | 240 |
| 10 | 12 650 | 30 x 20 | 165 | 550 | 150 | 2700 | 550 | 1200 | 600 | 300 |
| 11 | 18350 | 34 x 26 | 200 | 425 | 200 | 3600 | 450 | 1600 | 800 | 400 |
| 12 | 22550 | 40 x 30 | 250 | 400 | 225 | 4050 | 425 | 1800 | 900 | 450 |

^{*}Approximate number of revolutions per minute.

WILLEY GENERATORS AND MOTORS

ENGINE TYPE DIRECT CURRENT MULTIPOLAR GENERATOR



Fig. 9362A

ALTERNATING CURRENT MOTOR



Fig. 9362B

ENGINE TYPE MULTIPOLAR GENERATORS

| Size | Rated | No. of 16 C.P. 55 Watt | Approxima.e Number | | AMPERES | | Weight |
|------|-------|---------------------------|---------------------------|--------|---------|--------|--------|
| No. | K. W. | Inc'd Lamps 125 Volts | Revolutions per Minute | 125 V. | 250 V | 500 V. | Pounds |
| 61/2 | 25 | 450 | 350 | 200 | 100 | 50 | 2700 |
| 71/2 | 30 | 540 | 350 | 240 | 120 | 60 | 3250 |
| 8 | 40 | 720 | 300 | 320 | 160 | 80 | 4175 |
| 81/2 | 50 | 900 | 290 | 400 | 200 | 100 | 5750 |
| 9 | 60 | 1080 | 290 | 480 | 240 | 120 | 7150 |
| 10 | - 75 | 1350 | 275 | 600 | 300 | 150 | 8200 |
| 11 | 100 | 1800 | 250 | 800 | 400 | 200 | 11850 |
| 12 | 125 | 2250 | 225 | 1000 | 500 | 250 | 13800 |
| 13 | 150 | 2700 | 225 | 1200 | 600 | 300 | 16000 |
| 14 | 175 | 3150 | 175 | 1400 | 700 | 350 | 17200 |
| 15 | 200 | 3600 | 175 | 1600 | 800 | 400 | 22000 |

TABLE OF CAPACITIES ALTERNATING CURRENT MOTORS

| Frame Number | Speed r. p. m. | 1800 | 1200 | 900 | 720 | 600 |
|-----------------|---|------|----------------|------|------|-------|
| 0 | | 1/2 | | 1/4 | | |
| 1 | | 1 | 1/2 | | 1/3 | 1/4 |
| 2 | | | | 1/2 | | |
| 3 | | | 1 | | 2/3 | 1/2 |
| 4 | *************************************** | 2 | | 1 | | |
| 5 | | 3 | 2 | | 11/4 | 1 |
| 6 | *********************** | 5 | 3 | 2 | 13/4 | 11/2 |
| 7 | | 71/2 | 5 | 3 | 3 | 21/2 |
| 8 | *************************************** | 10 | $7\frac{1}{2}$ | 5 | 41/2 | 334 |
| 9 | | 15 | 10 | 71/2 | 6 | 5 |
| 10 | | 20 | 15 | 10 | 9 | 71/2 |
| 11 | | 25 | 20 | 15 | 12 | 10 |
| 12 | | | 25 | 20 | 15 | 121/2 |
| 13 | | | 30 | 25 | 18 | 15 |
| 14 | | | 40 | 30 | 24 | 20 |
| 15 | | | 50 | 40 | 30 | 25 |
| 16 | | | 60 | 50 | 36 | 30 |
| 17 | | | 70 | 60 | 45 | 3716 |

GASOLINE ENGINE DYNAMOS

NO-FLICKER GASOLINE ENGINE DYNAMO

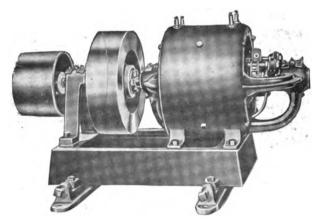


Fig. 3554 A

DIRECT CONNECTED UNIT

| Actual Horse Power | 2 | 3 | 4 | 6 | 9 | 12 |
|-------------------------------------|-----|-----|-----|-----|-----|------|
| Speedrevolutions per minute | 450 | 400 | 400 | 400 | 350 | 350 |
| Capacity, in 6 C. P. 55 Watt Lamps. | 16 | 30 | 40 | 60 | 90 | 120 |
| " " K. W | 0.9 | 1.8 | 2.5 | 3.5 | 5.5 | 7.25 |

BELTED UNIT

| Actual Horse Power | 10 | 15 | 20 | 25 |
|-------------------------------------|-----|-----|------|-----|
| Speedrevolutions per minute | 300 | 300 | 280 | 280 |
| Capacity, in 16 C. P. 55 Watt Lamps | 100 | 150 | 200 | 250 |
| " K. W | 6 | 10 | 12.5 | 15 |

MAKING ELECTRIC LIGHTS

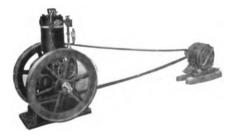


Fig. 3554B

The current from the Dynamo can be used for operating Incandescent Lights, Arc Lights, Electric Fans, Electric Pumps, Electric Motors, or for charging Storage Batteries for Automobiles or other uses. By placing a belt on the fly wheel, or on another pulley, it will in addition drive practically any class of machinery, and can thus be made to furnish electric light, water, and power.

STANDARD EDISON BASE LAMPS

50 WATTS, 100-130 VOLTS

50 WATTS, 200-260 VOLTS

60 WATTS, TUBULAR











Fig. 6985C

REGULAR

| 10 | 20 4 15 | 25 3 1 | 30 | 50 2 97 | 60 2 97 | 100 2 97 | 120 2.97 |
|-------------------------------------|---------------------------|--|---|--|--|---|---|
| $\frac{1\frac{3}{4}}{3\frac{1}{4}}$ | $\frac{21/8}{41/4}$ | $\frac{2^{1}_{18}}{4^{1}_{4}}$ | 2½ 4¼ | 2 ³ / ₈ 4 ³ / ₄ | 2 ³ / ₈ 4 ³ / ₄ | 3 534 | 3 534 |
| .20 | 200 .20 | $.22 \\ .20$ | .200 .22 .20 | .200 .22 .20 | .22 .20 | .40 .30 | .30 |
| | 5.0_ 134 314 200 | $\begin{array}{c cccc} 5.0 & 4.15 \\ \hline 134 & 21/8 \\ 31/4 & 41/4 \\ 200 & 200 \\ & \cdots & \cdots \end{array}$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ |

TUBULAR

| Size, Watts. Efficiency, Watts, per C. P | 30 | 60 | 120 |
|--|--------------------|-----------------|------|
| | 3.57 | 3.02 | 3.09 |
| Diameter inches | $\frac{11_4}{558}$ | 11 ₄ | 134 |
| Length | | 55/8 | 574 |
| Standard Package | 200 | 200 | 100 |
| | .30 | .30 | .55 |

ROUND BULB

| Size, Watts Efficiency, Watts. per C. P | 20 4.8 | 30 3.5 7 | $\begin{array}{c} 60 \\ 3.02 \end{array}$ | $\frac{120}{3.09}$ |
|--|---|---------------------------|---|--------------------|
| Diameterinches Length" | $\frac{2^{5}\cancel{16}}{3^{1}\cancel{2}}$ | $\frac{2^{5}_{16}}{31/2}$ | 25/16 31/2 | $\frac{31}{4}$ |
| Standard Package Price, 100 to 130 Volts each | $\begin{array}{c} 20\tilde{0} \\ .25 \end{array}$ | 200 .25 | 200 .25 | 100 .40 |

Carbon lamps are now rated at total watts at a certain efficiency in watts per candle power.

MAZDA LAMPS

REGULAR, PLAIN BASE



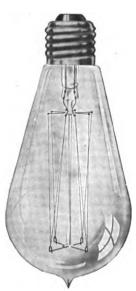




Fig. 6986A

Fig. 6986B

100- 125 VOLTS

| 100-120 10210 | | | | | | | | | | |
|-------------------|------|----------------|------|-------|------|------|------|------|------------|--|
| Watts | 25 | *40 | 40 | 60 | 100 | 150 | 250 | 40 | 60 | |
| Candle Power | 20 | 32 | 32 | 48 | 80 | 120 | 200 | †32 | †48 | |
| Diameterinches | 23 8 | $25/8 \\ 53/4$ | 25/8 | 31/16 | 3¾ | 43/8 | 5 | 33/4 | 5 | |
| Length " | 5 | 53/4 | 63/4 | 71/8 | 73/6 | 85/8 | 91/2 | 61/4 | 81/4 24 | |
| Standard Package | 100 | 100 | 50 | 50 | 24 | 24 | 12 | 24 | | |
| Price, Clear each | | .80 | .90 | 1.10 | 1.45 | 2.10 | 3.00 | 1.25 | 1.50 | |
| " Frosted " | . 75 | .85 | .95 | 1.17 | 1.55 | 2.25 | 3.20 | 1.25 | 1.50 | |

250 VOLTS

| Watts | 45 | 70 | 110 | 180 | 45 | 70 |
|------------------|------|----------|---------------------------------------|--|---------------------|------|
| Candle Power | 32 | 48 | 80 | 120 | †32 | †48 |
| Diameterinches | 25/8 | 31/6 | 33/4 | 4 ³ / ₈ 8 ⁵ / ₈ 24 | 43/8 | 5 |
| Length " | 63/4 | 7½ 50 | 7 ¹³ / ₁₆ 24 | 85/8 | $\frac{71_{2}}{24}$ | 81/4 |
| Standard Package | 50 | | | | | |
| Price, Cleareach | 1.35 | | 2.15 | 0.20 | | 2.25 |
| " Frosted " | 1.40 | 1.75 | 2.30 | 3.35 | 1.90 | 2.25 |

† Meridian Mazda Lamps.

The 25 and *40 Watt lamps have plain bases as shown by the illustration of the small size Regular Mazda lamp. The other lamps listed have insulated bases as shown by the illustration of the Meridian Mazda lamp.

The word "Mazda" is a trade name adopted by the General Electric Company and the National Lamp Association to designate the type of metal filament lamp which they have developed, after following the methods in the factories and laboratories of the leading Foreign and American Lamp Manufacturing Companies. The Mazda lamp will replace the old-style Tungsten and is the lamp to buy in order to be sure of the highest development of metal filament lamps.

BATTERIES AND SUPPLIES DRY BATTERIES No. 1897

No. 1894

No. 1899



No. 1893







Fig. 7797A

Fig. 7797B

Fig. 7797C

Fig. 7797D

| Number | 1892 | 1893 | 1894 | 1895 | 1896 | 1897 | 1899 |
|----------------------|--------|-------|--------|-------|--------|--------|--------|
| Sizeinches Priceeach | 1½ x 4 | 2 x 5 | 2½ x 6 | 3 x 7 | 3½ x 8 | 2½ x 6 | 2½ x 6 |
| | .60 | .60 | .60 | 1.20 | 1.40 | .60 | .30 |

GRAVITY

No. 2 SAMSON CARBON CYLINDER No. 15 ZINC

No. 2 ZINC













Fig. 7797E

Fig. 7797F

Fig. 7797G

Fig. 7797H

.10

| Price, | Cell Completeeach | 1.20 |
|--------|-------------------|------|
| 44 | Glass Jar | .50 |
| 44 | Zinc " | .70 |
| 44 | Copper | .17 |

GRAVITY BATTERIES, 6X8 INCHES

| Price, Cell Completeeach | 1.60 |
|---------------------------|------|
| " Carbon Vase. " | 1.10 |
| " Rubber Cover " | .16 |
| " Cylindrical Zine " | .30 |
| " Glass Jar " | .20 |
| CARBON CYLINDER BATTERIES | |
| Price, Cell Complete, | .60 |
| " Carbon Cylinder " | .3 |
| " C! T | |

| N 1 | er | 15 | 0 |
|-------|-----------------|-------|-----|
| | ZINCS | | |
| " | Zinc | " | .10 |
| ** | Glass Jar | " | .20 |
| ** | Carbon Cylinder | | .3 |
| rice, | Cell Complete, | .each | .6 |

TELEPHONES

No 012941



No. 350B

No. 114







Fig. 309A

Fig. 309B Fig. 309C DESK TELEPHONES

Fig. 309D

| Number | Number of Generator Box | Number of Desk Stand | Number of Generator Bars | Ohms Ringer | Туре | Price Each |
|---|----------------------------|-------------------------|-----------------------------|----------------|------------|----------------|
| $\begin{array}{c} 012941 \\ 012942 \end{array}$ | 114 114C | 21 21 | 4 | 1000 1000 | Bridging " | 12.77 13.61 |

All equipped with green silk receiver and connecting coils.

NEW BEAUTY MAGNETO TELEPHONES, SERIES

| Number | Number of | | | Price | Елсн | |
|--------|-------------------|----------------|---------|---------------------|-------------------|--------------------------------------|
| | Generator Bars | Ohms Ringer | Plain | With Push Button | With Condenser | With Push Button and Condenser |
| 250 | 3 | 250 | 7.50 | | | |
| | • | 3 1 | BAR BRI | DGING | | |
| 700 | 3 | 1000 | 8.00 | 8.25 | 8.50 | 8.75 |
| 706 | 3 | 1600 | 8.00 | 8.25 | 8.50 | 8.95 |
| 708 | 3 | 2500 | 8.25 | 8.50 | 8.75 | 9.00 |

Give perfect service on lightly loaded country wires.

4 BAR BRIDGING

| 250B | 4 | 1000 | 9.00 | 9.25 | 9.50 | 9.75 |
|------|---|------|------|------|------|-------|
| 256B | 4 | 1600 | 9.00 | 9.25 | 9.50 | 9.75 |
| 258B | 4 | 2500 | 9.25 | 9.50 | 9.75 | 10.00 |

Suitable for long distance service on heavily loaded lines.

MAMMOTH TELEPHONES

| 350B | 5 | 1000 | 10.25 | 10.50 | 10.75 | 11.00 |
|------|---|------|-------|-------|-------|-------|
| 356B | 5 | 1600 | 10.25 | 10.50 | 10.75 | 11.00 |
| 358B | 5 | 2500 | 10.50 | 10.75 | 11.00 | 11.25 |

Equipped with latest type parts and very strong.

MAGNETOS WITH INDUCTION COIL IN BOX

| Number | Number of Generator Bars | Ohms Ringer | Туре | Price Fach |
|--------------|-----------------------------|----------------|--------------------|---------------------|
| 113 114 | . 3 | 1000 | Series Bridging | $\frac{3.75}{4.25}$ |
| 114A 114B | 4 | 1200 1500 | "· | 4.25 4.25 |
| 114C 114D | 4 | 1600 2000 | 46 | 4.25 4.50 |
| 114E | 1 1 | 2500 | " | 4.50 |

TELEPHONE BRACKETS

EQUIPOISE TELEPHONE ARMS No. 7273

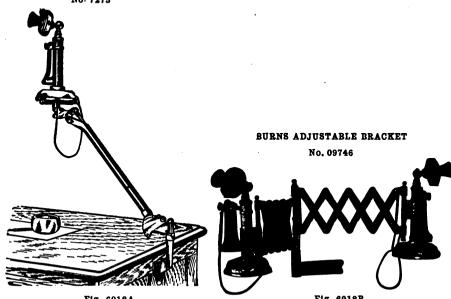


Fig. 6918A

Fig. 6918B

EQUIPOISE TELEPHONE ARMS

| Number | *7273 | *7274 | †7275 | †7276 | †7277 | +7278 |
|---------------------|-----------------|-------|------------|------------|------------|------------|
| Arm Extensioninches | $2\overline{4}$ | 30 | 24 | 24 | 30 | 30 |
| Drop" Priceeach | 3 75 | 4.25 | 10 4.50 | 15 4.75 | 10 5.00 | 15 5.25 |

^{*}For flat top desks and wall. †For roll top desks.

PARTS LINK EXTENSIONS

| Number | 7279 | 7280 | 7281 |
|------------|------|------|------|
| Sizeinches | 3 | 6 | 12 |
| Priceeach | .30 | .00 | .75 |

DROP EXTENSIONS

| Number | 7282 | 7283 | 7284 |
|------------|------|------|------|
| Sizeinches | 10 | 15 | 17 |
| Priceeach | . 75 | 1.00 | 1.00 |

BURNS ADJUSTABLE BRACKETS

| Number | 9745 | 9746 |
|----------------------|----------------|----------------|
| Description | Single Bracket | Double Bracket |
| Length, Closedinches | 7 | 7 |
| "Extended" | 23 | 25 |
| Priceeach | | €.00 |

KELLY IMPROVED DUPLEX GRINDING MILLS



Fig. 8768A

| Number | 00 | 0 | 1 | 2 | 3 | 4 |
|-------------------------------|---------|-------------|---------|----------|----------|-------------------|
| Heightinches | 20 | 32 | 40 | 42 | 44 | 48 |
| Width Over All " | 13 | 16 | 21 | 24 | 24 | 2 8 |
| Speedrevolutions per minute | 600-900 | 400-1000 | 700-900 | 800-1000 | 900-1100 | 900-1100 |
| Size Pulleyinches | 3½x5 | 6x6 | 6 x 6 | 8 x 6 | 10x8 | $12x9\frac{1}{2}$ |
| Diameter of Grinding Plates " | 4 | 6 | 6 | 71/2 | 9 | 12 |
| Capacity per Hour, bushels | 4 to 6 | 5 to 8 | 8 to 18 | 15 to 30 | 25-35 | 40-65 |
| Horse Power Required | 1-3 | 1½-6 160 | 4-6 | 6–8 | 10-15 | 15-25 |
| Weightpounds | 85 | 160 | 320 | 500 | 550 | 800 |
| Priceeach | | l | | l | ١ | |

A FEW REASONS WHY THE KELLY MILL IS CONSIDERED THE BEST

Because it is provided with a double set of grinders or burrs, for which reason it is called the Duplex.

Because it is the only mill manufactured which has double or duplex grinders.

Because it has a grinding surface of just double that of any other mill of equal size, and can, therefore, do twice as much work.

Because it can do as much work as any other mill of double its size.

Because it is very economical in the use of power, running much easier than any other mill.

Because it will grind any kind of grain, cotton seed, corn and cob, and corn, cob, and shucks equally well, and produce a grist of any desired quality, coarse, medium, or fine.

Because its shifting device for regulating the grinding is the most perfect known.

Because there is no end thrust on main shaft, under any conditions.

Because it is simple in construction, easily operated, strong, durable, and efficient

GRINDING MILLS QUEEN OF THE SOUTH



Fig. 3708A

| Diameter of Stone. inches | 15 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 36 |
|-------------------------------------|--------|----------|----------|----------|----------|----------|----------|----------|---------|
| Diameter of Pulley inches | 10 | 12 | 12 | 12 | 12 | 16 | 18 | 18 | 20 |
| Face of Pulley " | 6 | 8 | 8 | 8 | 8 | 9 | 10 | 10 | 10 |
| Size Pulley on Countershaft, | | | | | | | | | |
| Geared Mills " | 16x8 | 16x8 | 16x8 | 16x8 | 16x8 | 18x8 | 20x10 | 20x10 | 20x12 |
| Revolutions per min. | 500 | 500 | 500 | 500 | 500 | 450 | 450 | 450 | 400 |
| " of Countershaft " | 250 | 250 | 250 | 250 | 250 | 225 | 225 | 225 | 200 |
| Horse-Power | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 12 |
| Capacity per hour grinding feed bu. | 4 te 8 | 10 to 15 | 10 to 16 | 12 to 18 | 14 to 23 | 15 to 26 | 18 to 30 | 20 to 35 | 25 t 45 |
| Gross Weight Pulley Mill lbs. | 725 | 800 | 950 | 1050 | 1150 | 1250 | 1400 | 1500 | 2200 |
| " Geared " " | 875 | 950 | 1200 | 1350 | 1450 | 1600 | 1700 | 1800 | 2500 |
| Price Pulley Milleach | 160.00 | 180.00 | 200.00 | 220.00 | 250.00 | 280.00 | 310.00 | 350.00 | 450.00 |
| " Iron Geared Mill " | 225.00 | 240.00 | 260.00 | 290.00 | 330.00 | 350.00 | 380.00 | 440.00 | 540.00 |
| " Mortise Geared Mill " | 250.00 | 270.00 | 290.00 | 320.00 | 360.00 | 390.00 | 420.00 | 470.00 | 570.00 |

This Mill is very simple in construction, well designed, strong, compact, convenient of adjustment, light running, grinds uniformly, cool and rapid, and as a mill for the export trade it is particularly desirable, as many of those Mills have been in use for upward of 25 years without requiring any repairs, an occasional dressing of the stone being all that is necessary.

The adjustments are all simple yet positive, and can be accomplished while the mill

is in operation.

The Queen of the South Mill is the only mill of this class in which there is a simple and positive provision made for adjusting or tramming the standing stone, thus enabling the operator to maintain the stones parallel to each other, insuring uniform grinding and the least possible wear to the stone.

The lower or runner stone is strongly iron bound, and provided with a cast iron back with hub which is securely cemented to the stone, and to which the spindle is fitted, thus securing a stone of such strength that it can be run at a high rate of speed

without danger of breakage, and gives a very large grinding capacity.

The Mill is made in 9 sizes, ranging from 15 to 36 inches in size of stone or from 38 to 91 centimeters measured diametrically, requiring from 2 to 12 H. P. and giving a grinding capacity of from 2 to 10 bushels of wheat per hour where ground for making bolted or white wheat flour. From 2 to 20 bushels of wheat per hour where ground for unbolted or whole flour. From 4 to 30 bushels of maize per hour to the fineness usual for making bread or stock feed.

STURTEVANT PHOSPHATE PULVERIZERS

RING-ROLL MILLS

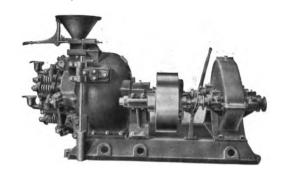


Fig. 2079A

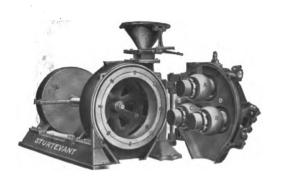


Fig. 2079B

Prices on application.

STURTEVANT PHOSPHATE PULVERIZERS

ROTARY FINE CRUSHER



Fig. 2080A

NEWAYGO SCREEN



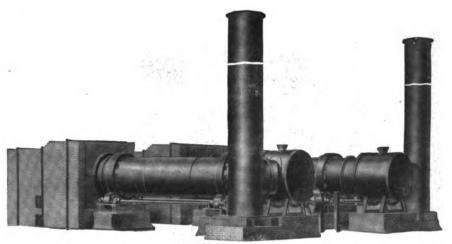
Fig. 2080B

Prices on application.



PHOSPHATE APPARATUS

LOMBARD IMPROVED ROTARY PHOSPHATE DRYER



Pig. 2281A

Plans and specifications furnished for complete phosphate washing machinery Phosphate dryers, pulverizers, elevators, conveyors, etc., on application.

IMPROVED BALL BEARING HYDRAULIC GIANT NOZZLE
FOR HYDRAULIC MINING OF PHOSPHATE, GRAVEL, ETC.

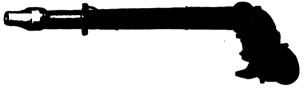


Fig. 2281B

Prices and descriptive matter on application.

PLATT'S PATENT SELF-FEEDING SINGLE ACTION ROLLER GINS

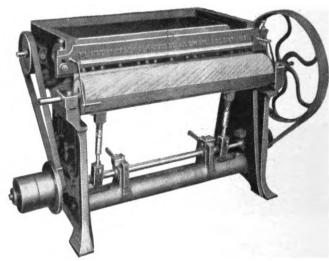


Fig. 2133A

This machine will gin satisfactorily every variety of cotton, but is particularly adapted to the black seed long staple cotton which is cultivated chiefly on the sea islands of the South Atlantic coast. When operated at the speed given in the table below the output will be from seventy-five to one hundred and twenty-five pounds of lint cotton per hour and the grade of the lint will be twenty per cent better than is turned out by any other device. It separates the seeds without crushing them or injuring the fibre in any way. We recommend a rigid foundation.

We import from the best English tanners their highest grades of walrus leather and can furnish ginners and repair shops strips of any width or thickness and can supply the trade in full sides.

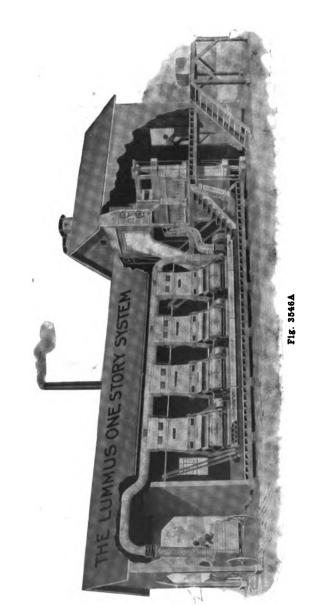
We operate a complete repair shop with the best appliances for doing any class of work in this line rapidly and accurately. We make a specialty of cutting leather in strips and covering rollers. An experienced force of operatives under direction of our expert insure the best workmanship and this with the best selected materials place our product in the highest class.

| Length Roller with Patent Self-Feeding Apparatusinches | 40 |
|--|---------------|
| Length Roller with Patent Self-Feeding Apparatusinches Speed of Crankrev. per minute | 650 to 700 |
| Indicated Horse Power Required | 116 |
| Indicated Horse Power Required Floor Space | 581/4 x 391/4 |

Prices and further information on application.

GIN HOUSE EQUIPMENTS

LUMMUS ONE-STORY SYSTEM



Plain and Hulling Gins, Feeders, Condensers, Single and Double Box Presses, Pneumatic Cotton Elevators, Vacuum System Outfits the backbone of the Gin Builders' Business. The Lummus Systems contain every available improvement Cotton Cleaners, Beet Distributors, etc.

which will at the same time leave the machinery simple, durable, economical and profitable to operate.

If nearly forty years of success as Gin Manufacturers means anything, it guarantees that the purchaser of their machinery secures always valuable and dependable improvements, which with their ginning line, place him in a position to operate with greatest satisfaction, economy, success and profit. Send for full descriptive catalogue.

Digitized by Google

COTTON GINS LUMMUS GALVANIZED STEEL ELEVATOR With Huller Glus and Cleaner Feeders

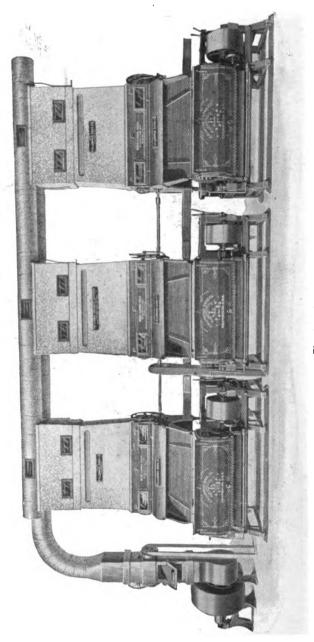


Fig. 3911A

NANCE STANDARD COTTON PRESSES



Fig. 1457A

Prices on application.

BALING PRESSES AND EXCELSIOR MACHINES

STEAM BALING PRESSES



Fig. 8014A

Used for excelsior, paper, etc. Has cylinder 10 inches in diameter with 36-inch stroke and 1 inch steam connections.

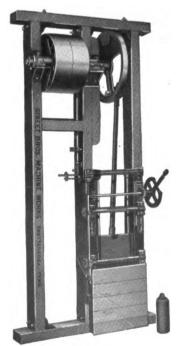


Fig. 8014B

SELF CONTAINED EXCELSIOR MACHINES

SPECIFICATIONS

| Size Tight and Loose Pulleysinches | 22x6 |
|--|----------------|
| Speed revolutions per minute Weight pounds | 200 |
| Weightpounds Horse Power Required | 1450 3 to 4 |
| Horse Power Required | 3104 |

Dimensions, 4×10 feet, 3×12 inches. Heavy timber frame bolted and braced with angle irons. Cutter heads are self centering and adjustable. Changeable feeding mechanism.

EVAPORATORS AND CANE MILLS

GOLDEN COOK EVAPORATORS PATENTED

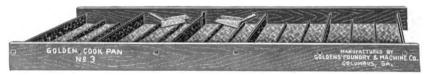
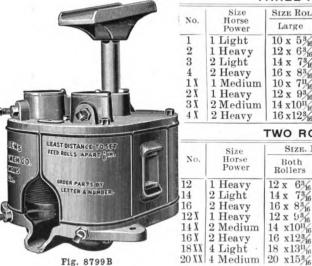


Fig. 8799A

| No. | Size | Cap. per Day | WEIGH | WEIGHT, POUNDS | | PRICE EACH | | |
|-----|----------|--------------|--------|----------------|--------|---------------|--|--|
| | Inches | Gallons | Copper | Galvanized | Copper | Galvanized | | |
| 2 | 44 x 72 | 35 to 50 | 70 | 66 | 40.CO | 20.00 | | |
| 3 | 44 x 90 | 50 " 75 | 83 | 78 | 50.00 | 25 .00 | | |
| 4 | 44 x 108 | 65 " 100 | 100 | 95 | 60.00 | 30.00 | | |
| 5 | 44 x 126 | 80 " 125 | 118 | 112 | 70.00 | 35.00 | | |
| 6 | 44 x 144 | 100 " 175 | 143 | 130 | 80.00 | 40.00 | | |
| 7 | 44 x 180 | 125 " 200 | 170 | 160 | 100.00 | 50.00 | | |

Copper Evaporators furnished with two copper skimmers, and Galvanized with two tin ones.

GOLDEN'S NEW MODEL CANE MILLS PATENTED



| No. | Size | SIZE ROLL | s Inches | Capacity | Price |
|-----|----------------|-------------|-----------|---------------------|--------|
| | Horse Power | Large | Small | per Hour Gallons | Each |
| 1 | 1 Light | 10 x 5% | 5 x 5 | 35 | 30.00 |
| 2 | 1 Heavy | 12 x 63/6 | 6 x 6 | 45 | 40.00 |
| 3 | 2 Light | 14 x 73/6 | 7 x 7 | 65 | 60.00 |
| 4 | 2 Heavy | 16 x 83/6 | 8x8 | 100 | 80.00 |
| 1 X | 1 Medium | 10 x 71/6 | 5 x 71/2 | 52 | 40.00 |
| 21 | 1 Heavy | 12 x 93/6 | 6 x 9 | 67 | 52.00 |
| 3 X | 2 Medium | 14 x1011/16 | 7 x 101/2 | 97 | 77.00 |
| 4 X | 2 Heavy | 16 x123/16 | 8 x 12 | 150 | 100.00 |

TWO ROLLER

THREE ROLLER

SIZE. INCHES Size Capacity Price per Hour Gallons No. Horse Both Journals Each Power Rollers 12 x 63/16 1 Heavy 45 44.00 2^{11}_{16} 2 Light 14 x 73/16 70 66.00 215/16 16 x 83/16 2 Heavy 100 88.00 58.00 12 X 1 Heavy 12 x 9% 67 14 x1011/16 211/16 14 X 2 Medium 84.00 105 215/16 2 Heavy 16 x123/16 16 X 150 110.00 18XX 4 Light 33/8 125to175 180.00 18 x1311/6

35/8

150to200 235.00

Mills are fitted with steel shafts, anti-friction metal bearings and steel screws with jamb nuts, so that rollers can be positively set. Gears are separate from rollers. In the XX or double extra heavy mills, the top is connected between bearings by two ribs and with extra side braces on box bearings. The adjusting screws are extra large and the bearings for rolls are extra long with large diameter journals. We can also furnish the XX mills without frames.

REGULAR WALL TENTS

Machine Sewed. Complete with Poles. Stakes, Guys, and Keys

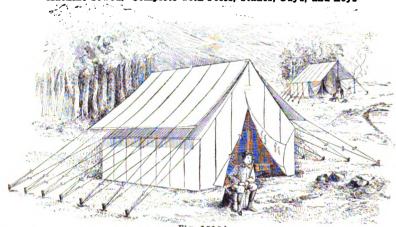


Fig. 1518A

| Size | , Feet | Height of Wall Feet | Price 8-oz. Duck Single Filling Each | Price 10-oz. Duck Single Filling Each | Price 10-oz. Duck Double and Twisted Filling, or 8-oz. Army Each | Price 12-oz. Duck Double and Twisted Filling or 10-oz. Army Each | Price 12-oz. Army Duck or No. 10 Each | Price 15-oz. Army Duel or No. 8 Each |
|------|--------|------------------------------|--|---|--|--|---|--|
| 7 | x 7 | 3 | 8.00 | 9.35 | 10.35 | 12.25 | 14.55 | 17.50 |
| 7 | x 9 | 3 | 9.50 | 11.05 | 12.30 | 14.60 | 17.50 | 20.90 |
| 9 | x 9 | 3 | 10.95 | 12.80 | 14.30 | 17.00 | 20.30 | 24.50 |
| 91 | 2x12 | 3 | 12.90 | 15.05 | 16.80 | 19.95 | 23.80 | 28.70 |
| 91 | 2x14 | 3 | 14.65 | 17.10 | 19.10 | 22.65 | 27.05 | 32.55 |
| 12 | x12 | 31/2 | 15.30 | 17 95 | 20.00 | 23.75 | 28.40 | 34.25 |
| 12 | x14 | 31/2 | 17.30 | 20.20 | 22.55 | 26.80 | 32.05 | 38.60 |
| 12 | x16 | 31/2 | 19.20 | 22.45 | 25.05 | 29.80 | 35.65 | 43.00 |
| 12 | x18 | 31/2 | 21.35 | 24.95 | 27.80 | 33.00 | 39.45 | 47.50 |
| 14 | x14 | 4 | 20.60 | 24.15 | 26.95 | 32.10 | 38.45 | 46.45 |
| 14 | x16 | 4 | 22.70 | 26.65 | 29.80 | 35.50 | 42.55 | 51.35 |
| 14 | x18 | 4 | 25.35 | 29.75 | 33.20 | 39.45 | 47.30 | 57.10 |
| 14 | x20 | 4 | 28.20 | 32.75 | 36.40 | 43.00 | 51.15 | 61.40 |
| 14 | x24 | 4 | 31.80 | 36.90 | 41.00 | 48.10 | 57.25 | 68.75 |
| 16 | x16 | 5 | 28.20 | 33.20 | 37.15 | 44.10 | 53.05 | 64.25 |
| 16 | x18 | 5 | 30.95 | 36.40 | 40.75 | 48.25 | 58.00 | 70.20 |
| 16 | x20 | 5 | 34.10 | 39.80 | 44.30 | 52.15 | 62.30 | 75.00 |
| 16 | x24 | 5 | 38.85 | 45.20 | 50.25 | 59.05 | 70.40 | 84.65 |
| 16 | x30 | 5 | 47.00 | 54.75 | 60.85 | 71.50 | 85.30 | 102.60 |
| 16 | x35 | 5 | 52.60 | 61.30 | 68.10 | 80.20 | 95.60 | 114.95 |
| 18 | x18 | 5 | 35.40 | 41.60 | 46.45 | 55.20 | 66.20 | 79.95 |
| 18 | x20 | 5 | 39.00 | 45.45 | 50.50 | 59.70 | 71.10 | 85.45 |
| 18 | x24 | 5 | 43.60 | 50.85 | 56.50 | 66.50 | 79.25 | 95.25 |
| 18 | x30 | 5 | 52.25 | 60.90 | 67.75 | 79.95 | 95.35 | 114.65 |
| 18 | x35 | 5 | 58.15 | 67.80 | 75.40 | 89.05 | 106.25 | 127.75 |

Note.—The above prices do not include Flies. If wanted, Flies for any size Tent will be furnished without poles at one-half the price of the Tent. If higher walls than list specified are wanted, add 5 per cent to list for each additional 6 inches of wall so added. Prices on large sizes and other styles on application.

BELTING

In Europe cog-wheels are used to transmit power almost exclusively, but in America 99% of the power transmitted is by belting. Cog-wheel transmission is positive. belting is not. because with every revolution of a pulley a portion of the power is lost; the loss varies with the condition of the belt, change of load, state of the atmosphere, etc. The power of a belt to transmit motion is derived from the friction hold on the pulley: this is governed by the pressure or tension; a safe maximum working tension is about 45 lbs. per inch in width. No dogmatic rule can be laid down to determine the efficiency of a belt. After a series of numerous experiments, Josuha Rose (modern machine shop practice) states that belts vary from 25 to 100% in efficiency, for reasons given above. A long belt will transmit more power than a short one of same width and tension. Consequently long belts are always the best if it is possible to use them. A 1-inch belt traveling 800 feet per minute and with power tension will transmit 1 horsepower. If the same belt travels 1,600 feet the power will be doubled. Each additional inch to the width will add 1 horse-power, at the same speed and tension. A belt under good conditions will deliver 97% of its efficiency. If belts are too tight there will be quite a loss from friction of the journals, etc.; if too loose there will be still more loss by slipping. Excessive slipping also dries out the leather and reduces the adhesion. Within reasonable limits the greater the speed the more efficient a belt will be. About 3,750 feet per minute seems to be the maximum. A double belt will last longer than a single one, and will take double the tension, and will transmit 7/10 more power, as capacity to transmit power is governed by the frictional width of belt and its pulling strength. A raw-hide belt will transmit from 25 to 50% more power than a tanned one, and for straight, non-shifting work is much the most economical, but it is not adapted to cone pulleys or counter shaft work. Belts should be used with the hair side to the pulley. If pulleys are covered with leather there will be a gain of 25% in wear of belt and in power transmitted.

It is best to have the belts run off from the main shaft in opposite directions to equalize the strain on the bearings. Let the diameter of the pulleys be as large as possible, within the maximum belt speed (3,750 feet per minute), and a belt should never be overworked, and the tension such as will give a slight sag when in motion. The per cent. of power lost by shaft journal friction should not exceed 20% of the full load; if it does it may be charged to tight belting. The breaking strength of good leather belting per inch in width is the solid leather, 675 lbs.; at rivet holes, 362 lbs.; at lacing holes, 200 lbs. It will be seen therefore, that belts would be far more durable if lacing could be done away with, as is being done in some establishments, the ends of belts being larged and computed thus making the pints as strong as the bedy of belts.

lapped and cemented, thus making the joints as strong as the body of belt.

TO FIND THE LENGTH OF BELT WANTED. Rule 1. Add the diameter of both pulleys together, divide by 2, and multiply quotient by 3½; add this product to twice the distance in inches between the center of shafts, and the final sum will be the length required. Example. Diameter of large pulley 24 in.+12 diameter of small pulley=36+2=18×3½=58½+216 twice distance between shafts=274½ inches, length required.

TO FIND WIDTH OF BELT required for a given horse-power. Rule 2. Multiply the horse-power by the constant 2,750, then multiply the diameter of driven

TO FIND WIDTH OF BELT required for a given horse-power. Rule 2. Multiply the horse-power by the constant 2,750, then multiply the diameter of driven pulley by the number of revolutions and divide the first product by the latter, the quotient will be the width of belt required. Example 2. Horse-power 28×constant 2,750=77,000; diameter of pulley 36 in.×revolution 200=7,200; 77,000+7,200=10 inches, width required.

TO FIND THE HORSE-FOWER which a belt will transmit. Rule 3. Multiply the width of belt by diameter of driven pulley in inches, multiply this product by revolutions of pulley per minute, then divide final product by constant 2,750, the quotient will be the horse-power. Example 3. Belt $10in. \times 36$ diameter of pulley= 360×900 resolutions -72000.42750 constant -265 horse power required.

tient will be the horse-power. Example 3. Belt 10in.×36 diameter of pulley=360×200 revolutions=72,000+2.750 constant=26.5 horse-power required.

THE HORSE-POWER AND WIDTH of belt given, find the diameter of driven pulley required. Rule 4. Multiply the horse-power by constant 2,750, now multiply revolutions of pulley by the width of belt, then divide the first product by the latter, the quotient will be the diameter wanted. Example 4. Horse-power 28×2,750=77,000; revolutions 200×10=2,000; 77,000+2,000=38.5, diameter wanted.

THE HORSE-POWER, DIAMETER OF PULLEY AND WIDTH OF BELT GIVEN, find the number of revolutions of driven pulley. Rule 5. Multiply the horse-power by 2,750, now multiply the diameter of pulley by the width of belt, and then divide the first product by the latter. Example 5. Horse-power $28 \times 2,750 = 77,000$; diameter 36×10 width = 360; 77,000 + 360 = 211.4 revolutions wanted.

The above rules assume that the driving and driven pulleys are of equal diameter, and the contact of belt half the circumference. If pulleys are of different diameter and contact of belt is less than half of circumference, then the rules must be modified as per

tables below of areas of contact.

TABLE OF BELT CONTACTS

| Degrees of contact. | | Fraction of contact. | Dec. fraction of circumf. | Ratio. | Constant— Single belt. | Double belt. |
|---------------------|----|------------------------|---------------------------|--------|---------------------------|-----------------|
| 90 ° | or | 1 ₄ = | .25 | 2.21 | 6080 | 4250 |
| 112° | 66 | 5/16= | .312 | 1.72 | 4730 | 3310 |
| 120° | 66 | 1∕3= | .333 | 1.6 | 4400 | 3080 |
| 135° | 66 | $3\overset{\circ}{a}=$ | .375 | 1.4 | 3850 | 2700 |
| 150° | 66 | 5/12= | .417 | 1.24 | 34 10 | 2390 |
| 165° | " | 7⁄16= | .437 | 1.17 | 322 0 | 2250 |
| 180° | 66 | ½ = | .500 | 1 | 27 50 | 1925 |

For all practical purposes, the arc of contact of belt on smaller pulley can be roughly estimated by comparison with figures in first column in table above. For example, take arc of contact 150° and compare it with your belt. If it agrees approximately, then taking Rule 3 we have Example 3 modified as follows: Belt $10\times36=360\times200=72,000+$ by new constant 3,410=21.1 horse-power, or a loss of 5.4 horse-power as compared with full contact or half circumference in Example 3.

OTHER RULES for finding speed and size of pulleys. To find size of driving pulley, multiply the diameter of driven by revolutions it should make, and divide the product by revolutions of driver. Example 1. Diameter of driven, 12 inches; revolutions, 240; revolutions of driver, 160; then $12\times240=2880+160=18$, diameter of driver wanted.

TO FIND THE SIZE OF DRIVEN PULLEY, multiply diameter of driver by its revolutions, and divide the product by revolutions of driven. Example 2. Diameter of driver, 18; revolutions, 160; revolutions of driven, 240; then, $18 \times 160 = 2,880 + 240 = 12$, revolutions of driven wanted.

TO FIND THE NUMBER OF REVOLUTIONS OF DRIVEN, multiply diameter of driver by its revolutions, and divide product by diameter of driven. Example. Diameter of driver, 18; revolutions, 160; diameter of driven, 12 inches; then, $18 \times 160 = 2,880 \div 12 = 240$, revolutions of driven wanted.

. TO FIND THE HORSE-POWER OF A DRIVING PULLEY, multiply the circumference of pulley by the revolutions, and this product by width of belt, and divide final product by 600. Example. Circumference of pulley, 56.55; revolutions, 160; width of belt, 6 inches; then $56.55 \times 160 = 9048 \times 6 = 54,288 + 600 = 9.04$, horse-power of pulley wanted.

TO FIND LENGTH OF BELT WHEN CLOSELY ROLLED

Add the diameter of the roll in inches to the diameter of the eye, multiply this by the number of turns. This result multiplied by the decimal, 1309 will give the length of roll in feet.



MEASUREMENT OF WATER IN PIPES

Square the diameter of the pipe in inches, and the product is the number of pounds weight of water

in one yard of the pipe.

As a gallon of water weighs about ten pounds, divide the number of pounds by 10, and the result is the number of gallons of water in one yard of the pipe.

FRICTION OF WATER IN PIPES

Friction loss in pounds pressure per square inch for each 100 feet of length in different size clean iron pipe, discharging given quantities of water per minute.

G. A. Ellis, C. E.

| ons r ute | Size of Pipe—Inside Diameter | | | | | | | | | | | |
|--------------------------|------------------------------|-----------|--------------|--------------|---------------------|--------|--------------|-------|-------|-------|-----------|-----------|
| Gallons per Minute | 34 in. | 1 in. | 1¼ in. | 1½ in. | 2 in. | 2⅓ in. | 3 in. | 4 in. | 6 in. | 8 in. | 10 in. | 12 in |
| 5 | 3.3 | 0.84 | 0.31 | 0.12 | | l l | | | | | | |
| 10 | 13.0 | 3.16 | 1.05 | 0.47 | 0.12 | | | 1 | | | | |
| 15 | 28.7 | 6.98 | 2.38 | 0.97 | |] | | | | | | |
| 20 | 50.4 | 12.3 | 4.07 | 1.66 | 0.42 | 1 | 12:22 | | | | | · • • • • |
| 25 | 78.0 | 19.0 | 6.40 | 2.62 | | 0.21 | 0.10 | | | | | |
| 30 | | 27.5 | 9.15 | 3.75 | 0.91 |] | | | | | | |
| 35 | | 37.0 | 12.4 | 5.05 | | ••••• | | | | 1 | | |
| 40 | | 48.0 | 16.1 | 6.52 | 1.60 | | | | | | | |
| 45 | • • • • • | | 20.2 | 8.15 | | 0.81 | 0.35 | 0.09 | | | | |
| 50 75 | • • • • • | • • • • • | 24.9 56.1 | 10.0 22.4 | $\frac{2.44}{5.32}$ | 1.80 | 0.35 0.74 | | | | • • • • • | |
| 100 | • · · · · | | | 39.0 | 9.46 | 3.20 | 1.31 | 0.33 | 0.05 | | ' | |
| 125 | | | · · · · · · | 1 | 14.9 | 4.89 | 1.99 | Į. | | | | • • • • • |
| 150 | | | | | 21.2 | 7.0 | 2.85 | 0.69 | 0.10 | | | |
| 175 | | | | | 28.1 | 9.46 | 3.85 | | | | | |
| 200 | | | | | 37.5 | 12.47 | 5.02 | 1.22 | 0.17 | | | |
| 250 | | | | | | 19.66 | 7.76 | 1.89 | 0.26 | 0.07 | 0.03 | 0.01 |
| 300 | | | | | | 28.06 | 11.2 | 2.66 | 0.37 | 0.09 | 0.04 | |
| 350 | | | | | | | 15.2 | 3.65 | 0.50 | 0.12 | 0.05 | 0.02 |
| 400 | | | | | | 1 | 19.5 | 4.73 | 0.65 | 0.16 | 0.06 | |
| 500 | | | | ' | | | 30.8 | 7.43 | 0.96 | 0.25 | 0.09 | 0.04 |
| 750 | | | | 1 | | | | | 2.21 | 0.53 | 0.18 | 0.08 |
| 1000 | | | | | | | | | 3.88 | 0.94 | 0.32 | 0.13 |

Doubling the diameter of a pipe increases its capacity four times. Friction of liquids in pipes increases

Doubling the diameter of a pipe increases as capacity of the square of the velocity.

The mean pressure of the atmosphere is usually estimated at 14.7 pounds per square inch, so that with a perfect vacuum it will sustain a column of mercury 29.9 inches, or a column of water 33.9 feet high.

To find the pressure in pounds per square inch of a column of water: Multiply the height of the column in feet by .434. Approximately, we say, that every foot elevation is equal to ½ pound pressure per square inch; this allows for ordinary friction.

To find the height of a column of water, multiple of the square inch; this allows for ordinary friction.

To find the pressure in pounds per square inch of a column of water: Multiply the height of the column in feet by .434. Approximately, we say, that every foot elevation is equal to ½ pound pressure per square inch; this allows for ordinary friction. To find the height of a column of water, multiply the pressure by 2.31.

To find the diameter of a pump cylinder to move a given quantity of water per minute (100 feet of piston being the standard of speed): Divide the number of gallons by 4, then extract the square root, and the product will be the diameter in inches of the pump cylinder.

To find quantity of water elevated in one minute running at 100 feet of piston speed per minute: Square the diameter of the water cylinder in inches and multiply by 4. Example: Capacity of a 5-inch cylinder is desired. The square of the diameter (5 inches) is 25, which multiplied by 4 gives 100, the number of gallons per minute (approximately)

cylinder is desired. The square of the diameter (5 inches) is 25, which multiplied by 4 gives 100, the number of gallons per minute (approximately).

To find the capacity of a cylinder in gallons: Multiplying the area in inches by the length of stroke in inches will give the total number of cubic inches; divide this amount by 231 (which is the cubical contents of a U. S. gallon in inches) and product is the capacity in gallons.

The capacity per minute will be determined by multiplying this product by number of strokes cylinder in replicits per minute.

The capacity per minute will be determined by multiplying this product by number of strokes cylinder is working per minute.

To find the horse-power necessary to elevate water to a given height: Multiply the number of gallons per minute by 8.35 (weight of one gallon), and this result by total number of feet water is raised (that is, from surface of the water to the highest point to which the water is raised), and you have the power in foot-pounds. Divide by 33,000, and you have the horse-power. One horse-power is equal to about five men. To the theoretical power a liberal allowance for friction, etc., always wants to be added. It is estimated that it requires, approximately, one horse-power, including friction, to raise sixty gallons of water per minute thirty-three feet high. It is immanterial whether it is raised with a large or small pump, as the theory is, it requires a given quantity of power to raise a given quantity of water

gallons of water per minute thirty-three feet high. It is immaterial whether it is raised with a large or small pump, as the theory is, it requires a given quantity of power to raise a given quantity of water a given height in a given length of time. Of course, if the pump is large it must be worked slowly; and if small, it can be worked faster; the power required to work a small pump fast is the same as to work a large pump slow for the same given height and quantity.

To find the area of a required pipe, the volume and velocity of water being given: Multiply the number of cubic feet of water by 144, and divide the product by the velocity in feet per minute. The area being found, it is easy to get the diameter of pipe necessary.

To find the velocity in feet per minute necessary to discharge a given volume of water in a given time: Multiply the number of cubic feet of water by 144, and divide the product by the area of the pipe in inches.

pipe in inches.



Avoirdupois Weight

| Drachms | | | |
|-------------|-------------|-------------------------|----|
| 16 — | 1 oz. : | = 437.5 grains troy. | |
| 256 = | 16 | 1 lb. = 1.2153 lbs. tro | y. |
| 6,400 = | 400 == | 25 = 1 quarter. | - |
| 25,600 = | | 100 = 4 = 1 cwt. | |
| 512000 = 3 | 2.000 = 2.1 | 000 = 80 = 20 = 1 ton. | |

Troy Weight

| Grains. | |
|---|------|
| 24 = 1 dwt. | |
| 480 - 20 - 1 os. | |
| 5.760 = 240 = 12 = 1 lb. $= 22.816$ cubic inches of | dis- |
| tilled water at 62°Fahr | |

Dry Measure

| Pints = 33.6 cubic inches. |
|---|
| 2- 1 quart-67.2 cubic inches. |
| 8 = 4 - 1 gallon $= 268.8$ cubic inches. |
| 16 = 8 = 2 = 1 peck = 537.6 cubic inches. |
| 84 - 22 - 8 - 4 - 1 bushel |

64-32-8-4-1 bushel.

Note.—The standard U. S. bushel is the Winchester hushel, which is in cylinder form, 18½ inches in diameter and 8 inches deep, and contains 2 150.42 cubic inches.

Square Messure

| -4 |
|--|
| Inches. |
| 144 = 1 foot. |
| 1.296 - 9 - 1 yard. |
| 39,204 = 272.25 = 30.25 = 1 perch. |
| 1.568.160 - 10.890 - 1.210 - 40 - 1 rood. |
| 6,272,640 = 43,580 = 4,840 = 160 = 4 = 1 acre. |
| An acre is 69.5701 yards per square; or, 208 |
| 710321 feet square. |
| A township is 6 miles square = 36 sections. |
| A section is 1 mile " = 640 acres. |
| " is ½ " " = 160 " |
| |

A span is the distance that can be reached between the end of the middle finger and the end of the thumb. Among sailors 8 spans are equal to 1 thumb.

thumb.

A geographic mile is \$1\frac{1}{2}\sigma\$ of the distance around the center of the earth.

A square mile of land is called a section.

A Gunter's chain, used by land surveyors, is 4 rods, or 66 feet long, and consists of 100 links.

7.92 inches make a link.

Canal and railroad engineers use an engineer's chain, which consists of 100 links, each 1 foot long.

Paper Measure

| Quire of pape | er | | .24 sheets. |
|---------------|---------|---------|-------------------------|
| Ream of pap | er | | 20 quires or 480 sheets |
| Bundle | | | 2 reams. |
| Bale | | | |
| Roll of parch | ment . | | .60 skins, |
| Sheet of pa | aper fo | lded in | to— |
| 2 l | eaves i | s terme | ed folio size. |
| 4 | ** | " | 4to or quarto. |
| 8 | u | ** | 8vo. or octavo. |
| 12 | ** | ** | 12mo, or duodecimo. |
| 16 | 4 | u | 16mo. |
| 18 | 4 | " | 18mo. |
| 24 | æ | ** | 24mo. |
| 48 | * | • | 48mo. |

Apothecaries' Weight

| Grains. | |
|-----------|------------------------|
| 20 | 1 scruple or 9 |
| 60 - | |
| 480 = | 24 = 8 = 1 oz. or § |
| 5.760 = 2 | 288 - 96 - 12 - 1 lb. |

Apothecaries' Measure

| 60 minims | l fluid-drachm |
|-----------------|----------------|
| 8 fluid-drachms | l fluid-ounce |
| 16 fluid-ounces | 1 pint |
| 8 pints | l galion |

Forty-five drops, or a common teaspoonful, make about 1 fluid-drachm; 2 tablespoonsful, about 1 fluid-ounces; a wineglassful, about 1½ fluid-ounces; and a teacupful, about 4 fluid-ounces.

Liquid or Wine Measure

| Gills — 7.2 | 2187 cub | ic inches. | | |
|-------------|-----------|-------------|---------------|---------|
| 4 — | | | cubic inches. | |
| 8 = | 2 - | 1 quart | -57.75 cubic | inches. |
| 32 - | | 4- 11 | | |
| 2.016 - | 404 - 2 | 252 - 63 - | 1 hogshead. | |
| 4.032 - 1. | 008 - 4 | 504 = 126 = | = 2 = 1 pipe. | |
| 8.064 = 2. | 016 = 1.0 | 008 = 252 = | -4-2-1 top | ١. |

8,064-2,016-1,008-252-4-2-1 ton.

Note.—The standard unit and liquid measure adopted by the U. S. government is the Winchester wine gallon, which contains 231 cubic inches, and holds 8,339 pounds, avoirdupois, of distilled water, at its maximum density weighed in air, the harmeter being at 20 inchests.

barometer being at 30 inches.

The imperial gallon, adopted by Great Britain, contains 277.274 cubic inches, and equals 1.20032

12 15 8 gallon

Weight of Water

| 1 cubic inch | | pounds. | | | | |
|-----------------|---------------|--------------|--|--|--|--|
| 12 cubic inches | 0434 | pounds. | | | | |
| 1 cubic foot | | U.S. gallons | | | | |
| 1 U. S. gallon | 8.355 | pounds | | | | |
| 1.8 cubic feet | | pounds | | | | |
| 2,240 pounds | 268.8 | U.S.gallons | | | | |

Liquid Weight

| | | Avoirdupois. |
|----------|-----------------|--------------|
| 1 gallon | distilled water | 10 |
| | proof spirits | |

Oils

| 1 | eallo | Lbs. Avoirdupot | 8. |
|----|-------|---------------------------|----|
| î' | Ber 4 | whale 732 | |
| i | u | lard 733 | |
| i | * | tallow | |
| • | * | neat's-foot71 | |
| • | 44 | paraffine, 28° gravity7% | |
| • | ** | paraffine, 25° gravity714 | |
| • | | reduced Franklin | |
| • | 44 | castor8 | |
| • | 4 | | |
| | | kerosene 632 | |



FORMULAE FOR CALCULATING PUMP PROBLEMS

- 1. Diameter multiplied by 3.1416 = Circumference.
- 2. Circumference multiplied by .3183 = Diameter.
- 3. The square of the diameter multiplied by .7854 = Area.
- 4. A gallon of fresh water weighs 8 1/4 lbs. and contains 231 cubic inches.
- 5. A cubic foot of water weighs 62 1/2 lbs. and contains 1.728 cubic inches, or 7 1/2 gallons.
- 6 A cubic foot per second equals 450 gallons per minute.
- 7. An acre-foot is 325,829 gallons per minute.
- 8. The term "miner's inch" of water is more or less indefinite, but is approximately equal to a flow of 11 ½ gallons per minute. This varies in different States from about 9 to 13 gallons per minute.
- 9. To find the diameter of a pump cylinder required to move a given quantity of water per minute, the piston travel being 100 feet per minute, divide the number of gallons, by four, then extract the square root and the result will be the diameter in inches.
- 10. To find the area of required pipe, the volume of water being known, multiply the number of cubic feet of water by 144 and divide the product by the velocity in feet per minute. This gives the area of pipe, from which it is easy to determine the diameter.
- 11. To find the velocity in feet per minute necessary to discharge a given volume of water in a given time, multiply the number of cubic feet of water by 144 and divide the product by the area of the pipe in inches.
- 12. With steam pumps the area of the steam piston multiplied by the steam pressure gives the total amount of pressure exerted. The area of the water piston multiplied by the pressure of water per square inch gives the resistance. A margin must be made between the power and resistance to move the pistons at the required speed, usually reckoned at from 25 to 40 per cent.

D = Diameter of Cylinder in inches.

G = Quantity in gallons per minute.

S = Length of Stroke in inches.

H - Height water is elevated in feet.

N = Total Number of Strokes per minute.

A = Area of Cylinder in square inches.

Area of Cylinder in square inches = $D^2 \times .7854$

Capacity of Pump per stroke in cubic inches = S X A

Capacity of Pump per stroke in gallons = $\frac{S \times A}{231}$

Capacity of Pump per stroke in cubic feet $=\frac{S \times A}{1728}$

Capacity of Pump per stroke in pounds = $\frac{S \times A \times S \times A}{S \times A \times S \times A}$

Capacity of Pump per minute in cubic inches = $S \times N \times A$

Capacity of Pump per minute in gallons (G) = $\frac{S \times N \times A}{231}$

Capacity of Pump per minute in cubic feet = $\frac{8 \times N \times A}{1728}$

Pressure per square inch in pounds of a column of water = H × .434

Horse-power required to elevate a given quantity of water $\frac{1}{3000} = \frac{G \times H \times 8 \frac{1}{2}}{33000}$

In figuring the actual horse-power required to operate a pump, the "friction head" should be added to the "actual head" or elevation. This is given in the lower table on the preceding page.

Using the above formula and including the "friction head," will give the theoretical horse-power.

To figure the actual horse-power required it is necessary to know the efficiency of the pump. To illustrate:

If the efficiency of a small pump is $33\,\%\%$, the actual horse-power required is three times the theoretical.

If the efficiency is 50%, the actual horse-power is double the theoretical.

If the efficiency is 66 24 %, the actual horse-power is 1 1/2 times the theoretical, etc.



TABLE OF AREAS OF CIRCLES

| Diameter, Inches | Area, Sq. Inches | Diameter, Inches | Area, Sq. Inches | Diameter, Inches | Area, Sq. Inches | Diameter, Inches | Area, Sq. Inches |
|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| - 1 | .012 | 71 | 47 17 | 183 | 268.80 | 371 | 1104.5 |
| i | .049 | 8 | 50.26 | 192 - | 283.52 | 382 | 1134 1 |
| 1 | .110 | Š1 | 53.45 | 191 | 298.64 | 383 | 1164.2 |
| i | . 196 | ši | 56.74 | 202 | 314.16 | 39 | 1194.6 |
| i i | .307 | 8 | 60.13 | 201 | 330.06 | 391 | 1225 4 |
| ĵ | . 442 | ∥ š' | 63.61 | 212 | 346.36 | 40 | 1256.6 |
| ŧ | 601 | 91 | 67 20 | 214 | 363.05 | i. 40 i | 1288.3 |
| 1,3 | 785 | j ši | 70.88 | 222 | 380.13 | 41 | 1320 3 |
| i i i | .994 | 91 | 74.66 | 22} | 397.60 | 413 | 1352.7 |
| iî | 1.227 | 10 | 78.54 | 23 | 415.47 | 42 | 1385.4 |
| i i | 1.484 | iŏi | 82.51 | 234 | 433.73 | 421 | 1418 6 |
| il | 1.767 | ioi | 86.59 | 24 | 452.39 | 43 | 1452.2 |
| il | 2.073 | iŏi | 90.76 | 244 | 471.43 | 434 | 1486 2 |
| i i | 2.405 | ii' | 95.03 | 25 | 490.87 | 44 | 1520 5 |
| i ž | 2.761 | iii i | 99.40 | 251 | 510.70 | 443 | 1555.3 |
| 2" | 3.14 | iii | 103.86 | 26 | 530.93 | 45 | 1590.4 |
| 21 | 3.97 | 111 | 108.43 | 26} | 551.54 | 451 | 1626.0 |
| 21 21 21 | 4.90 | 12 | 113.09 | 27 | 572.55 | 46 | 1661.9 |
| 2 \$ | 5.93 | 121 | 117.85 | 274 | 593.95 | 464 | 1698 2 |
| 3 | 7.06 | 121 | 122.71 | 28 | 615.75 | 47 | 1734.9 |
| 31 | 8.29 | 12 f | 127.67 | 284 | 637.94 | 473 | 1772.1 |
| 31 | 9.62 | 13 | 132.73 | 29 | 660.52 | 48 | 1809.6 |
| 31 | 11.04 | 13} | 137.88 | 291 | 683.49 | 484 | 1847.5 |
| 4 | 12.56 | 134 | 143 13 | 30 | 706.86 | 49 | 1885.7 |
| 41 | 14.18 | 13 | 148.48 | 303 | 730.61 | 493 | 1924.4 |
| 4l | 15.90 | 14 | 153.93 | 31 | 754.76 | 50 | 1963.5 |
| 4.5 | 17.72 | 141 | 159.48 | 314 | 779.31 | 501 | 2003.0 |
| 5 | 19.63 | 144 | 165.13 | 32 | 804.25 | 51 | 2042.8 |
| 5} 5\ | 21.64 | 141 | 170.87 | 323 | 829.57 | 511 | 2083.1 |
| 51 | 23.75 | 15 | 176.71 | 33 | 855.50 | 52 | 2123.7 |
| 51 | 25.96 | 151 | 182.65 | 333 | 881.41 | 523 | 2164.S |
| 6 | 28.27 | 151 | 188.69 | 34 | 907.92 | 53 | 2206.2 |
| 6} | 30.67 | 15 | 194.82 | 341 | 934.82 | 533 | 2248.0 |
| 61 | 33.18 | 16 | 201.06 | 35 | 962.11 | 54 | 2290.2 |
| 61 61 7 | 35.78 | 164 | 213.82 | 351 | 989.80 | 541 | 2332.8 |
| 7 | 38.48 | 17 | 226.98 | 36 | 1017.88 | 55 | 2375.8 |
| 71 | 41.28 | 173 | 240.52 | 364 | 1046.4 | 553 | 2419.2 |
| 7 š | 44.17 | 18 | 254.46 | 37 | 1075.2 | 56 | 2463 0 |

HORSE POWER OF SHAFTS

We publish herewith a table used in general practice for the transmission of power where shafts are

we pushed helewin a table used in general practice to the supported.

When shafts are used for conveying power from one point to another without any of the bending strains of pulleys, gears, etc., the next smaller size may be used.

This table must not be confounded with tables of actual strength of shafts published by other author-

HORSE POWER OF SHAFTS FOR GIVEN DIAMETER AND SPEED

| Diameter | REVOLUTIONS PER MINUTE | | | | | | | | | | |
|--|------------------------|-------------|-------------|-------------|------------|-------------|-------------|--------------|--------------|--------------|--|
| of Shaft, Inches | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 300 | 350 | 400 | |
| 1 0 | 2.4 | 3 - | 3.6 | 4.2 | 4.8 | 5.4 | 6 | 7.2 | 8.4 | 9.6 | |
| 113 | 4.3 6.5 | 5.4 8 | 6.5 9.7 | 7.6 11.2 | 8.6 | 9.8 14.6 | 10.8 16 | 13 19.4 | 15.2 22.4 | 17.2 26 | |
| 1 1 1 1 1 1 1 1 1 1 1 | 10 | 12.5 | 15 | 17.5 | 20 | 22.5 | 25 | 30 | 35 | 40 | |
| 24 | 14 20 | 17.8 25 | 21 30 | 24.5 35 | 28 40 | 31.5 45 | 35.6 50 | 42 60 | 49 70 | 56 80 | |
| $\frac{5}{2}$ | 26.5 | 32.5 | 40 | 44.6 | 53 | 59 | 65 | 80 | 89 | 106 | |
| 2 13 | 34 | 42.5 | 51 | 59.5 | 68 | 76.5 | 85 | 102 | 119 | 136 | |
| $\frac{3}{3}$ | 54 80 | 67.5 100 | 81 120 | 94.5 140 | 108 160 | 122 180 | 135 200 | 162 240 | 189 280 | 216 320 | |
| 4 17 | 114 | 142.5 | 171 | 199.5 | 228 | 256.5 | 285 | 342 | 399 | 456 | |
| 4 12 | 156 208 | 195 260 | 234 312 | 273 364 | 312 416 | 351 468 | 390 520 | 468 624 | 546 728 | 624 832 | |
| 57 | 270 | 337.5 | 405 | 472.5 | 540 | 607.5 | 675 | 810 | 945 | 1080 | |
| 57 57 61 67 | 340 420 | 25 525 | 510 630 | 595 735 | 680 840 | 765 945 | 850 1050 | 1020 1260 | 1190 1470 | 1360 1680 | |
| 8 | 640 | 800 | 960 | 1120 | 1280 | 1440 | 1600 | 1920 | 2240 | 2560 | |

It is well to say in this connection that no matter what general rules are adopted, here are frequently special cases in which the engineer or designer must depart from his rules, and use his judgment in determining both the size of the shaft and the number and location of bearings.



RULES AND TABLES

H. P. = $\frac{P-L-A-N}{33.000}$

P—Pounds Pressure per Square Inch L—Length of Stroke in Feet A—Area of Piston in Square Inches N—Number Revolutions per Minute

HORSEPOWER

Horsepower is an amount of mechanical force capable of raising 33,000 pounds one foot high, per minute.

RULE TO FIND HORSEPOWER OF AN ENGINE

Area of piston in inches, multiply by pressure per square inch, multiply by speed of piston in feet per minute, and that product divided by 33,000.

The pressure per square inch should be the mean pressure throughout the stroke exerted on the piston, which can be found by attaching an indicator to the engine. The result will be what engineers term, indicated horsepower.

For the net effective horsepower, deduct from the above about one-quarter for friction of the working parts.

When the indicator is not used, and in the calculation the boiler pressure is substituted for the mean effective pressure, deduct from the result obtained from 40 to 60 per cent, for loss by condensation and friction of steam in pipes and passages, decrease of pressure in cylinder due to expansion, back pressure of exhaust, and friction of the working parts.

For engines from 20 to 60 horsepower, an average of 50 per cent may be deducted; for smaller engines more.

The mean pressure in the cylinder when cutting of at

| - 14 | stroke | equals | boiler | pressure | multiplied | bу | .597 |
|------|--------|--------|--------|----------|------------|----|------|
| 1.5 | •• | •• | ** | ** | •• | ** | .670 |
| 3/8 | ** | ** | ** | ** | ** | " | .743 |
| 1 2 | ** | ** | ** | ** | ** | " | .847 |
| 5/8 | ** | . ** | ** | ** | ** | ** | .919 |
| 3/3 | ** | •• | ** | ** | ** | " | .937 |
| 3/ | ** | ** | •• | 44 | ** | •• | .966 |
| 36 | ** | ** | •• | ** | ** | •• | .992 |

The horsepower of boilers is best defined by the heating surface of a boiler and is different according to their construction. A tubular boiler will give one horsepower to every 15 square feet of heating surface; a flue boiler every 12 square feet, and a cylinder boiler 10 square feet gives one horsepower. There is no standard law governing the horsepower of steam boilers, but this rule is adopted by most experts as a fair rating.

One cubic foot of water evaporated per hour = 1 nominal horsepower.

 $7\frac{1}{2}$ pounds of coal consumed per hour will evaporate 1 cubic foot of water = 1 horsepower.

1 square foot of grate will consume on average 12 pounds of coal per hour = 13 horsepower

A theoretically perfect steam engine consumes 33 pounds of coal per hour, per horsepower.

Marine condensing engines consume 2 to 6 pounds of coal per horsepower.

FUEL

| 1 pound of coal will evaporate | from | 7 to | 10 | pounds | of | water. | | | |
|---|------|------|----|--------|----|--------|--|--|--|
| 1 " dry pine wood " | ** | 4 to | 5 | ** | " | ** | | | |
| 1 ton of anthracite coal requires a space of 42 cubic feet. | | | | | | | | | |

1 " bituminous " " 44 " " 1 " coke " " 80 " "

150.35 cubic feet of air are required for the combustion of 1 pound of coal,

•

